

THE IRON AGE

THURSDAY, SEPTEMBER 14, 1893.

Hydraulic Machinery of R. D. Wood & Co.

R. D. Wood & Co. of Philadelphia have one of the largest and most notable exhibits in Machinery Hall, at the World's Fair. It is located near the power plant and occupies a space 66 x 25 feet. Large as this space would seem to be it is by no means adequate to show specimens of all the leading products of this firm. They are, as is

and a hoist of 50 feet. Two hydraulic swing cranes are also shown, one at each end of the exhibit. One of these is a fixed jib riveter crane, of 3000-pounds capacity, with a hydraulic lift which suspends a portable riveter from the jib. The supply of water is taken from an internal tube, which also serves to feed the riveter suspended from it. The valve allows adjustment within $\frac{1}{4}$ inch. The other swing crane is a bracketed rising jib crane, of the moving

"open" or "shut," as indicated by these words on the top castings. At the other end of the pipe is a Taylor revolving bottom gas producer. Grouped near by are gate valves from 32 inches down, specimens of cast-iron pipe made at Camden, N. J., in 1843 and buried until dug up to bring to the World's Fair, but in a remarkably good state of preservation. There is also a bronze wheel for an 1100 horse-power Geyellin-Jonval turbine. A center seal for gas

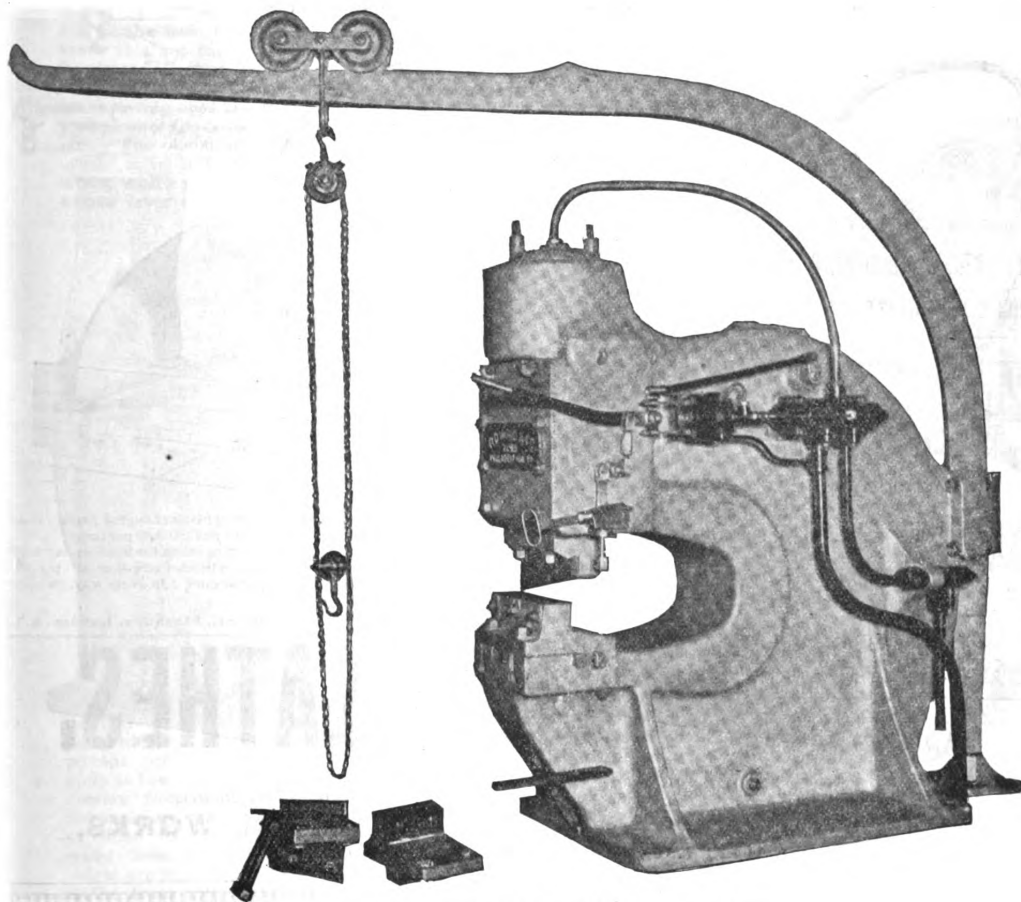


Fig. 1.—Automatic Hydraulic Shear.

HYDRAULIC MACHINERY OF R. D. WOOD & CO.

well known, manufacturers of cast-iron pipe, hydraulic and gas-making appliances and an important line of machinery. Their exhibit is so designed that it represents strikingly the special features of their business. A hydraulic traveling crane of 15,000 pounds capacity, having three motions, is erected in a runway covering the entire space. It is shown in operation and is an admirable specimen of the firm's achievements in this particular line. They have a crane of this type at work at Madison, Maine, having a span of 150 feet, with a bridge travel of 320 feet,

cylinder type, 6000 pounds capacity, 20-foot radius, specially adapted for use in boiler and plate shops, but capable of general service.

Extending across one corner of the space is a 72-inch cast-iron water pipe on a platform with steps at both ends. Multitudes of visitors walk through this pipe and examine it with much curiosity, having never before seen such a mammoth pipe. Standing like sentinels at one end of this pipe are a pair of patent indicator valve posts, whose function is to show to every passer-by whether the valve under it is

works is on an intricate casting of large size. In the rear, on racks, are shown the Mathews patent fire hydrants. More of these hydrants are used in making the central inclosure for an office, where they are placed vertically. In all some 40 hydrants are used, and each bears the name of the city in which it has been adopted. Those used in the frosty North are conspicuously long, as compared with the type adopted in the South, where there is no danger of freezing. In the rear of the office space is a brick set bench of gas retorts with Matton's self-sealing mouthpiece, in

which the pressure for sealing is applied at three points. Of further interest to gas engineers are Mitchell's patent scrubber and Hopper's gas governor. On each side of the entrance to exhibit is a stand pipe of the kind used for filling water carts, &c., their swinging arms meeting in the center and forming an archway. Illustrations of gasometers and other large work undertaken by the firm are made by photographs and drawings framed and hung up in suitable places.

Hydraulic Machinery.

Although R. D. Wood & Co., have but recently embarked in the manufacture of hydraulic tools, they have already attained prominence in this branch and their exhibit is extremely interesting. It is, in fact, the only

ure, enabling a low-pressure system to be used for delivering high-pressure water for individual machines. These tools are all shown in operation, and attract much attention by their massiveness of construction, ease of handling, perfection of control and absence of gearing.

Hydraulic Shear.

The automatic hydraulic shear shown in Fig. 1 has a 25-inch gap, is provided with a 1000-pound crane and is intended for spitting or cross cutting up to $\frac{1}{4}$ -inch steel plates. The head is cast round, and a steel cylinder lined with brass fitted to it with a bayonet joint; the ram is of cast iron and bolted to it; a rectangular slide carries the blocks for the shear blades. The slide and the bed of the machine are made so that

the ram comes against it, opening the valve and admitting pressure, and again causing the ram to move out.

Hydraulic Punch and Riveter.

The automatic punch or horizontal riveter shown in Figs. 2 and 3 may, by simply changing the tools, be arranged to punch a $\frac{1}{4}$ -inch hole through $\frac{1}{4}$ -inch steel plates, or close $\frac{1}{4}$ -inch rivets. When used as a punch the stroke is adjustable between $\frac{1}{4}$ and 4 inches. The gap is 30 inches. The machine is fitted with return gear and adjustable stops for regulating the length of the stroke. The body is of cast iron with a cast-steel cylinder lined with brass; the slide is also of steel and is cut away to enable the work to be seen and at the same time giving the head a much lighter appearance. The slide is re-

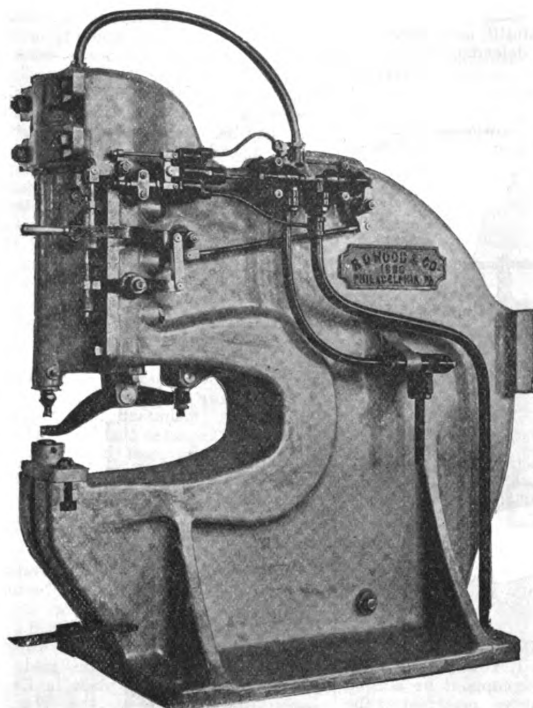


Fig. 2.—Hydraulic Punch.

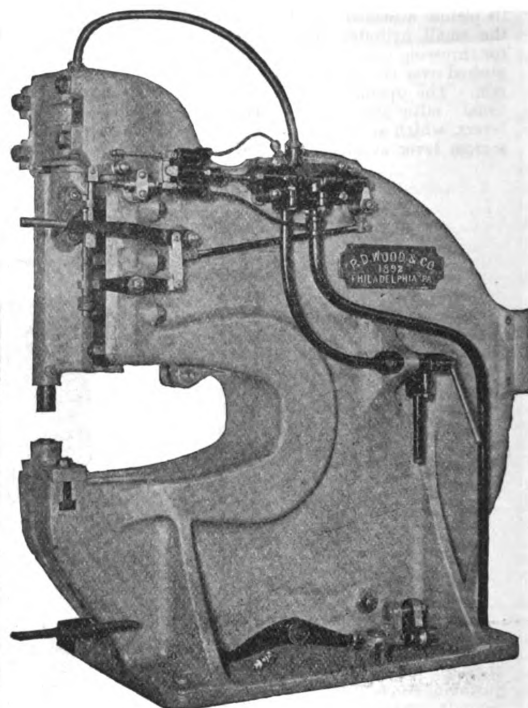


Fig. 3.—Hydraulic Riveter.

HYDRAULIC MACHINERY OF R. D. WOOD & CO.

display of such tools made at the exposition. They show a very complete plant, consisting of a pressure pump for 750 pounds per square inch, an inverted accumulator, giving a constant pressure in the mains leading to the machines, an 8-foot gap 70-ton plate closing fixed riveter, a triple-power, flush top fixed riveter, with head of new design, having the slide cut away to enable the operator to get a clear view of his work, a new sliding body portable riveter of heavy design, a 12-inch gap bear riveter, a 36 inch gap portable riveter of the parallel type, an automatic hydraulic punch or horizontal riveter, which will punch $\frac{1}{4}$ -inch holes through $\frac{1}{4}$ -inch plates or close $\frac{1}{4}$ -inch rivets, an automatic hydraulic shear with a 25-inch gap for spitting or cross cutting up to $\frac{1}{4}$ -inch steel plates, and a continuous hydraulic intensifier for supplying water at any desired pressure,

different types of blades or dies can be readily attached. The valve gear differs from that on the punch, in that it is operated entirely by an auxiliary cylinder; it can be made to run the machine continuously. The little miter valves connect with the two sides of a piston, in one with the main valve spindle. Opening the one or the other causes the valve to move in the required direction. A permanent stop is arranged on a rod at the bottom end of the stroke, and at the top a wedge-shaped catch gear, which can be thrown in or out at will. The machine is started by pulling on the hand lever, the ram descending till it comes in contact with the bottom stop. This opens the little valve and causes the cylinder to throw over the main valve to exhaust, and the main ram is forced back by the "push-back" cylinder. At the top of the stroke, if the wedge piece is pulled out,

ceased at the sides, and in these stop pieces, formed on the inside face of the slide bars, project, forming a positive stop for the slide; to put in a new leather, the bars have simply to be wedged out, and this allows the ram to be pushed far enough down to expose the leather, and so enable the operator to put in a new one. A light stuffing box is provided at the mouth of the cylinder to prevent water leaking past the main leather from falling down over the work. The main valve is operated in either direction by a lever; but to make the return stroke automatically, a pair of miter seat spring valves and small cylinder are arranged. At the bottom of its stroke a projection on the slide moves the operating lever, which in its turn opens the auxiliary valve, admitting pressure to the small cylinder; this throws over the main valve and opens it to exhaust, the push-back con-

nected up to constant pressure forcing back the main slide. This gear can, if necessary, be made a continuous running one, and for certain classes of work it may be advisable to make it so.

Hydraulic Intensifier.

The automatic hydraulic intensifier, Fig. 4, is intended for increasing the pressure available in a plant, say 100 to 750 pounds, up to the pressure (1500 pounds) at which these machines work. Two cylinders, $6\frac{1}{2}$ inches in diameter by 24 inch stroke, are fixed horizontally to a channel iron bed; in these piston rams with ram front 5 inches in diameter work through stuffing boxes, ordinary hemp packing being used; the piston is packed with hemp also. To the end of the rams, wrought-iron projecting pieces are fixed, and these slide along two rods which are connected by levers to a cross shaft at the end of the bed; a second shaft underneath this one carries a cylinder, with its piston attached to the upper rod; the small cylinder contains a spring for throwing open the valves when it is pushed over the center by the outgoing ram. The operating valves are of the usual miter-seat type, operated by levers, which are connected by rods to a cross lever at the front end of the

ment reverses the valves of the second cylinder, causing the second ram to be forced out, till it in its turn throws over the spring cylinder, and so on; in this way a continuous running intensifier is made possible, and a pressure of 1500 pounds per square inch obtained for working some of the tools.

The Burden Decision.

Justice Edwards of the Supreme Court has rendered a decision in the action brought by I. Townsend Burden against James A. Burden, John L. Arts and the Burden Iron Company of Troy, N. Y. The case was an important and unusually interesting one. The Burden Iron Company are one of the largest corporations of their kind in the country. Their hoeshoes are known the world over. Their plant is large and their property includes farms, residences and extensive mining interests. I. Townsend Burden, plaintiff, and James A. Burden, principal defendant, are brothers; John L. Arts, general manager of the company; Nicholas J. Gable and James A. Burden, Jr., defendants, trustees with I. Townsend Burden, James A. Burden and John L. Arts of

withdrawn without the consent of the trustees; the transactions of the Hudson River Ore & Iron Company were perfectly legitimate.

The plaintiff cited that James A. Burden and John L. Arts had entered a collusion to deny him a voice in affairs; the increase in trustees was in violation of an agreement at the time of incorporation, June, 1881; the power of the manager was too great, he doing a business, financial and manufacturing, of \$2,500,000 annually, having given no bond or security; his annual salary of \$12,000 was too much; the trustees were mismanaging the farms and making useless expenditures; James A. Burden and John L. Arts were interested financially in the Hudson River Iron & Ore Company and using their connection to further that interest.

The decision is in favor of the company. The increase in the trustees was legal. The power conferred upon the general manager by the trustees was lawful, and the petition to withdraw the property of the company from the funds of the corporation was denied. The transactions with the Hudson River Iron & Ore Company were within the powers of the two companies. The affair had been prudently and honestly managed, and the business profitable.

Since the commencement of the controversy Nicholas J. Gable and James A. Burden, Jr., have been chosen trustees to succeed Rev. William Irvin and Richard Irvin, Jr. The amount of the capital stock of the corporation is \$2,000,000, and it is divided into 2000 shares of \$1000 each, of which James A. Burden and I. Townsend Burden own 998 shares each, while the remaining four shares are distributed among the other three trustees. The Burden Iron Company are one of the most successful iron manufacturing corporations. It is expected that there will be an appeal on the most important law points involved in the case.

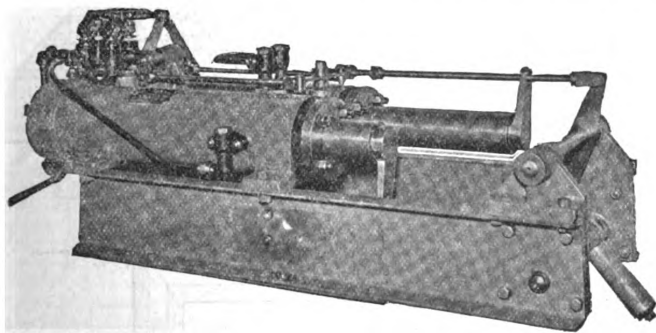


Fig. 4.—Hydraulic Intensifier.

HYDRAULIC MACHINERY OF R. D. WOOD & CO.

main cylinder; the upper rod works through an eye in the lever, with adjustable stops on each side. The 750 pounds pressure enters the main valve body at the back, and there is free connection from this to the front end of the main cylinders, check valves being provided to prevent the high-pressure water from returning. The pressure valves are at the back, and the exhaust at the front end of the body, one side being open to pressure while the other is to exhaust; the inlet to the back end of the cylinder is directly under the valve body. The high-pressure water is led away from the top of the front end of the main cylinders, a check valve being placed at each cylinder to prevent the water returning from the one to the other.

The operation is as follows: Water at 750 pounds pressure is admitted to the rear end of one cylinder, the opposite valve being open to exhaust; the first ram is thus forced out; constant pressure being on the front of the second ram all the time forces it in, the water in the rear of it escaping through the exhaust pipe. Toward the end of the stroke the arm on the ram coming in contact with the stop pushes the lever over the center, and the spring cylinder closes the first valve, at the same time opening it to exhaust; the same move-

ment reverses the valves of the second cylinder, causing the second ram to be forced out, till it in its turn throws over the spring cylinder, and so on; in this way a continuous running intensifier is made possible, and a pressure of 1500 pounds per square inch obtained for working some of the tools.

I. Townsend Burden in the bill of particulars asked for a receiver for the Burden Iron Company, asked that the court order the by-law conferring the full management of the corporation upon Mr. Arts be rescinded, the action of the company in increasing the number of trustees from three to five be annulled, the residences and farms and the stock the company held in the Port Henry Iron Company and other property be withdrawn from the funds of the company, and that the corporation be enjoined from using the products of the Hudson River Ore & Iron Company.

The defense contended that the application for a receiver was unwarranted, there being a large surplus above the liabilities; the powers conferred upon the general manager were necessary and the increase in the number of trustees legal; the farms and residences and other property had been transferred to the Burden Iron Company by I. Townsend Burden and could not be

Western Foundrymen's Association.

The regular meeting of the Western Foundrymen's Association will be held Wednesday evening, September 20, in rooms 702 and 703, Temple Court Building, Quincy and Dearborn streets, Chicago. Some effort was made to have this meeting take place in Engineer's Headquarters at the World's Fair, but the details could not be satisfactorily arranged, and it will therefore be held in the usual place. There are some interesting topics to be discussed, and an election for president will be held. George M. Sargent of the Sargent Company has been nominated for this position. The officers of the association are very anxious to secure a good attendance at the meeting, and the notices have been issued early so that they can arrange their business to enable them to be present. It should be borne in mind that interest in the work of the association is best promoted by full attendance at the meetings.

Some of the transactions to which producers have been driven by the necessity for raising money will have their effect a good deal later on. A large Southern iron company finding it necessary to secure money, raised in New York the sum of \$180,000 on pig iron, giving the capitalist the option, for six months, to buy the iron at any time at prices agreed upon. We need hardly add that these prices are very low—in fact, below the cost of production.

The Collection of Dust Produced in Workshops.*

BY R. KOHFAHL, HAMBURG, GERMANY.

On February 20, 1888, the United States Patent Office granted to F. Prinz two patents relating a "dust collector for flour mills." A company was organized in Milwaukee, which pushed the manufacture of the new machine with energy, and it was soon widely spread over those establishments of the country for which it was destined.

The Prinz dust collector afforded a perfect filtration of the dust-laden air close to the places where it was produced. The cleaned air could be allowed to re-enter the room from which it was taken, while the more or less valuable dust or bran was continually collected, and, therefore, ready for any further process. These advantages offered by the new machine were of such quality that it was rapidly introduced into most of the flour mills of the country.

From the United States the Prinz dust collector was exported to England and Germany. . . . In Germany a very good chance was given for the application of dust collectors, and in consequence many new constructions were brought upon the market. It became evident, however, very soon that different kinds of dust also required different handling. The very fine dust, for instance, in mills for Portland cement, for phosphate, for slag or for chalk is far more difficult in treatment than the dust of flour mills, which for the greatest part is composed of the coarser particles of bran.

Such more difficult problems of dust removing the Prinz collector has not quite been able to master, nor have the competing apparatus given more satisfaction, which were but imitations of the former in part. To create a machine suitable also for the more difficult cases it became necessary to find out the reasons for the failure of the known constructions, and then to invent a new one which would be free from the faults of the former. It is to a form of dust collector which has stood the test on the most different problems of dust removing, and which really may be called a universal apparatus, that the author desires to call attention. Before, however, describing this dust collector the author will try to explain the reasons of the limited applicability of the Prinz collector. Assuming as well known the construction and operation of this machine, two sections of which are given in Figs. 1 and 2, the author expresses his belief that the said reasons are to be found in—

1. The rotating cage.

2. The arrangement of the filtering cells around a horizontal axis.

The strain of the ribs forming the cage or balloon changes at every rotation of the latter, and this circumstance must damage at last the coherence of the cage. The exact working of the apparatus, and especially of the back draft of air, depends upon the air-tight contact of the tube 1 with the inner ribs 2 of the cage. If these ribs cease to form an accurate cylinder the close contact is destroyed, and now more or less of the back draft of air

entering the tube 1 will be lost by leakage.

the dust-filled space is punctuated. If the air in the apparatus is at rest for

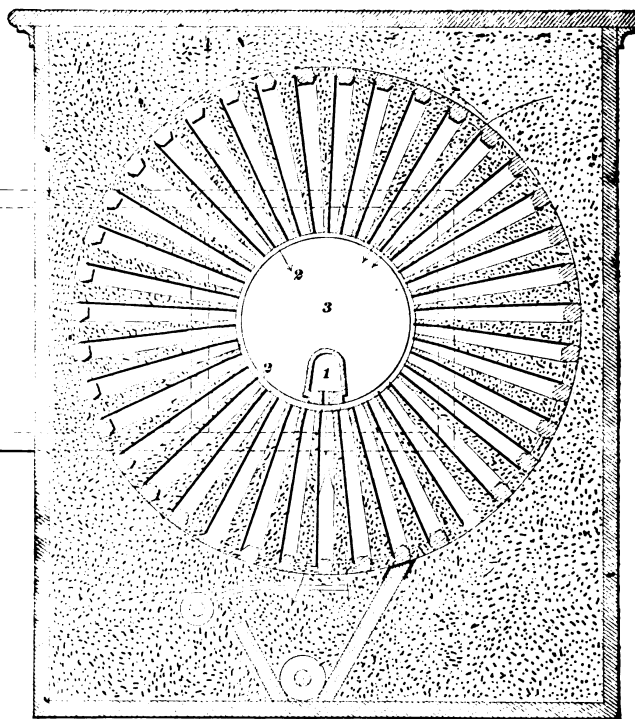


Fig. 1.

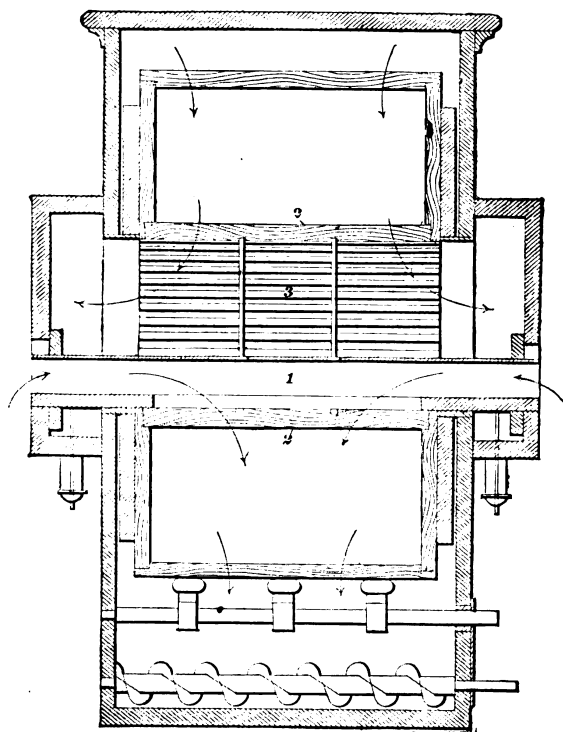


Fig. 2.—The Prinz Dust Collector.

THE COLLECTION OF DUST PRODUCED IN WORKSHOPS.

As to the arrangement of the filtering cells around a horizontal axis, attention may be called to Fig. 1, where all some time, every particle of dust will sink down under the influence of gravity until it hits on a solid wall. It will

* Abstract of paper presented at the World's Engineering Congress, Chicago, July, 1893, American Society Mechanical Engineers.

be seen that only from between three or five of the lower cells the dust can fall down unhindered unto the bottom of the casing. Between all the other cells, however, the falling dust will be stopped by the walls of the cells and will rest on the filtering cloth; moreover, in the cells of the upper part of

by far the greatest part of the time. Therefore the arrangement of the cells around a horizontal axis must be called an inappropriate one.

Nagel & Kaemp Dust Collector.

In the dust collector here to be described, which also uses a back draft of

open at the top and extending through the upper horizontal wall of the compartment 4. From the said cylinder branches off a hollow arm, 7, having at its lower side an opening adapted to register with one of the cells, the flanged edges of the said opening being in sliding contact with the partition wall 2.

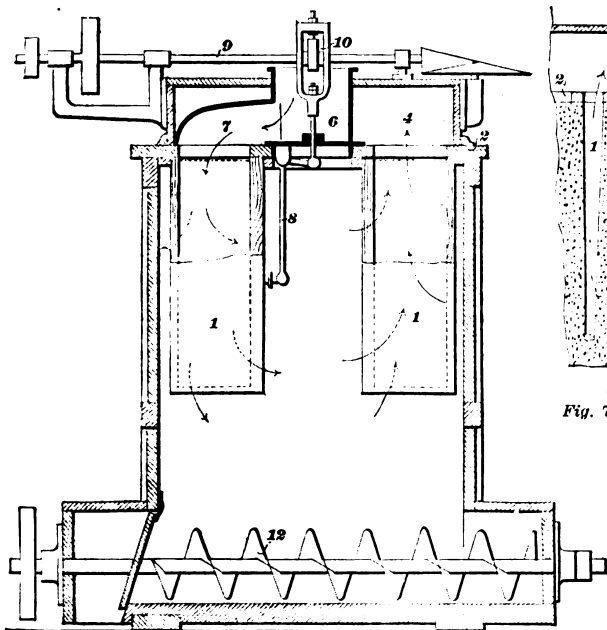


Fig. 3.—Vertical Section.

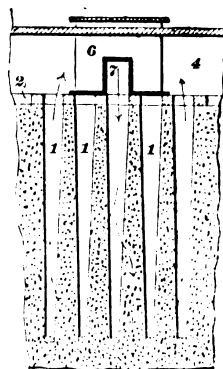


Fig. 7.—Section on a b of Fig. 6.

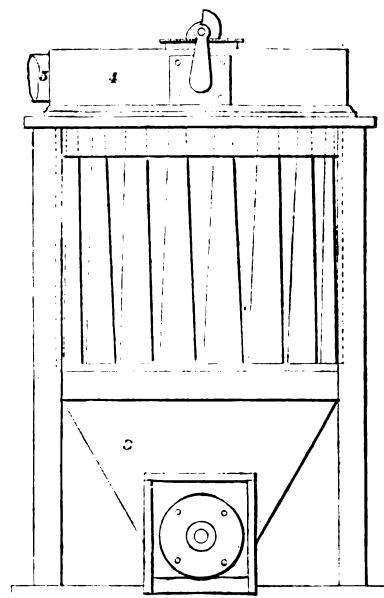


Fig. 4.—End Elevation.

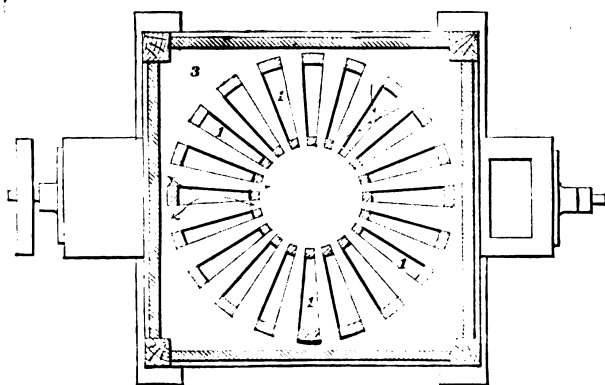


Fig. 5.—Sectional Plan.

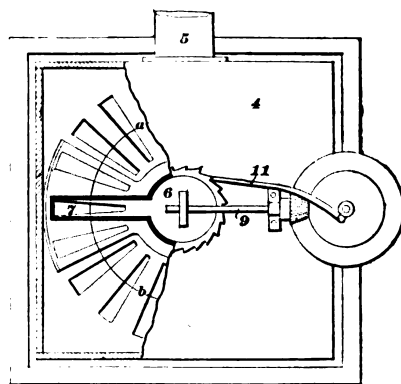


Fig. 6.—Sectional Plan.

The Nagel & Kaemp Dust Collector.

THE COLLECTION OF DUST PRODUCED IN WORKSHOPS.

the balloon dust will enter from outside of it. Of course, gravity will act in the dust collector, when set at work, exactly in the same manner. The dust-laden air being drawn radially in between all the cells, gravity will diminish the obstruction of the flannel through the air draft only at the few lowest cells, while at all the other cells it will increase the obstruction; and this increasing action will last for every cell until it has become again one of the lowest by the turning of the cage—i. e.,

air for the cleaning of the cloth, the said disadvantages are totally avoided. The cloth covered filtering cells 1 are screwed unto a strong horizontal plate, 2, the openings of which, shown in Fig. 6, correspond exactly with the open upper ends of the cells 1. The plate 2 divides the lower part 3 of the chest from the upper part 4 of the same. The upper compartment 4 is connected by the pipe 5 with a suction fan, and within it there is placed a rotative hollow cylinder, 6, closed at the bottom and

To the cylinder 6 a hammer, 8, in the shape of a bent lever, is fixed, which is operated from the shaft 9 by a cam and the rod 10. The cylinder 6 is provided with teeth, the number of which is equal to the number of cells; it is rotated by a pawl, 11, in such manner that the hollow arm 7 will always come to rest for a short time exactly over one of the cells. A creeper, 12, discharges continually the dust collecting in the chest.

The dust-laden air enters into the

lower part of the chest by a pipe extending preferably into the cylindrical inner part of the cage. It then spreads radially between the cells and the lower part of the chest, and is filtered through the vertical flannel walls. As the exhaustor blowing off the cleaned air evacuates the upper compartment 4, and indirectly also the lower compartment 3, fresh air from the surrounding room will, on account of its higher pressure, flow through the cylinder 6 and the hollow arm 7 into that single cell just covered by the said arm and pass through the cloth of this cell into the compartment 3. At the same time the hammer 8 imparts several blows to the same cell, the cloth of which is thus perfectly cleaned by the combined action of the back draft of air and the blows of the hammer. The arrows in Figs. 3, 5 and 7 indicate the movement of the air.

It will be seen that in this dust collector—

1. The cage is fixed immovably to a solid and stationary plate; that,

2. The instrument for introducing the back draft of air rests and slides on this stationary plate, and therefore can be kept easily and constantly in air-tight contact; that,

3. All the filtering cells being arranged vertically, the dust can fall down unstopped from any point between the cells as well as from outside of them; and that,

4. Gravity at each point diminishes the obstructing action of the dust-laden air, but increases the cleaning action of the back draft.

These advantages account for the great superiority of the dust collector herein described over the competing machines as proved by practical experience. The former reaches the same capacity with far less amount of filtering surface, and with the same surface does a great deal more work. The machine is at the present time built in four sizes, with wooden or iron chest, with or without an exhaustor, with or without a mechanism for the automatic discharge of the dust, the latter being a creeper for the smaller sizes and a hopper boy for the larger. The ribs of the cage are always made of wood on account of a more convenient fastening of the cloth; only in such exceptional cases as for the filtration of hot gas, iron is used also in this place, while at the same time the cloth is so impregnated as to become fire proof. The chest is provided with large doors on each side through which the cage can be brought in conveniently. The cage itself is composed of four quadrants, from which each cell can be easily detached, thus facilitating the changing or repairing of single cells. The distance from one cell to the other is wider than usual in order to prevent the choking of the intermediate spaces, and is particularly wide in dust collectors for cotton mills, the dust of which is fibrous and inclines to cohere. Each dust collector is also furnished with a vacuum gauge, indicating the difference of the pressures of the air in front of the cloth and behind it. If the machine is started in the right way and not overcharged, the indication of this vacuum gauge does not change at work. This could only happen if by any sudden overcharging of the collector the clogging of the cloth should be increased above the normal. It is, therefore, possible to convince one's self of the normal condition of the filtering surfaces without opening the doors of the chest, by only glancing at the vacuum gauge. This renders very

easy the control of the machine at work.

A few words may be devoted, finally, to the theory of the apparatus. Suppose p_0 to be the atmospheric pressure, p_1 the pressure of air in the lower compartment 3, and p_4 that in the upper compartment 4; the dust will be pressed against the cloth with the pressure $p_0 - p_4$, and will be blown off from it with the pressure $p_0 - p_1$. Each cell being subjected to the obstruction by dust for a far greater time than to the cleaning back draft, the pressure $p_0 - p_1$ must evidently be larger, mostly exceedingly larger, than the pressure $p_0 - p_4$. The difference of these two pressures must be the greater the more difficult the handling of the dust to be operated on proves. The experiments made with the Nagel & Kaemp dust collector have taught that for the proportion $p_0 - p_1 : p_0 - p_4$ the figure 2 to 3 will suffice for the most easily operated kind of dust; as, for instance, the light bran from middlings purifiers, while it must be raised to the value 5 to 10 for other kinds of dust, or even to 15 to 20 in the most difficult cases. The means for adjusting the said proportion exactly to that value which experience has taught to be necessary for a certain kind of dust in order to keep the cloth clean exist in the correct regulating of the quantity of dust-laden air offered to the collector. This quantity may be greater for coarse, heavy or flat dust, and must be diminished for fine, light or globular dust. Of course, it is a matter of experience what quantity of dust-laden air the collector may be charged with, and, consequently, what cross section must be given to the suction pipe in each special case. The experiences gathered in this respect with the Nagel & Kaemp dust collector extend very far, as the machine has already been tried and is now constantly working with excellent success in the following branches of industry: Flour mills, pearling mills, rice mills, grain elevators, cement manufactories, potteries, mills for chalk, for Thomas slag, for granulated slag, for phosphates and artificial dung; manufactories of soda, of oil, of conserves, of chocolate, for peeling coffee; jute manufactories, cotton mills, paper manufactories, works for cleaning carpets or feathers, mills for sulphur, for tartar, for sugar and for cinchona bark.

As the Nagel & Kaemp dust collector up to date has been able to master such very difficult problems, and as it has consequently acquired great appreciation in Germany, the author hopes and thinks it likely that it will make its way in time also in the United States and elsewhere.

Now that the worst is over a number of curious incidents of the recent financial panic are cropping up. This is one of them: An insurance company paid \$10,000 due to a person in a small town in Kansas, who duly deposited the check in a local bank. The latter gave it to an express company for collection with peremptory instructions to collect in currency and ship. The check was duly presented at the New York bank, which offered a certified check payable through the Clearing House and pleaded that payment in cash would be embarrassing. Currency was insisted upon. The bank officers sought the aid of the insurance company, who insisted on standing aloof from the transaction. The bank officers then determined to have some revenge, and when later in the day the express company's agent

called there were delivered to him, in duly sealed packages as they came from the mint, 10,000 silver dollars. The freight cost the Kansas bank between \$300 and \$400, and it has probably concluded that it does not always pay to insist upon the pound of flesh.

WORLD'S FAIR NOTES.

E. W. Bliss Company

of Brooklyn, N. Y., and their Stiles & Parker Press Company, make a very large and interesting exhibit of presses, dies and special machinery for working sheet metal at Column L42, in Machinery Hall. All the machines shown are belted up and can be put in operation for the instruction of visitors. They comprise specimens of the Nos. 34 and 14 Bliss toggle drawing presses, Nos. 18, 19 and 21 Bliss adjustable power presses, No. 954 Stiles straight-sided double-crank press, two Stiles drop hammers and Nos. 0, 1, 2, 3, 34, 4 and 5 Stiles power punching presses. The No. 14 toggle drawing press is a huge machine used in the manufacture of large sheet metal ware, weighs 70,000 lbs., will take in a blank up to 44 inches in diameter, and will draw to a depth of 14 inches, making 7 strokes per minute. This machine, however, is not the largest built by the company. Their No. 209, not exhibited, takes a blank 60 inches in diameter and draws to a depth of 18 inches. The No. 34 press takes a blank up to 20 inches in diameter and draws to a depth of 5 inches. The two presses shown serve their purpose in illustrating the system on which these machines are built. Cams are entirely dispensed with, the blank-holder being operated by means of toggles. According to the size of the press, one or two rock shafts are used to which the blank-holder slide is connected by means of toggle links. These rock shafts are operated from the main shaft by a peculiar system of link work which imparts through the blank holder a thoroughly uniform pressure to the blank. The strain arising from the pressure put upon the blank is transferred through the straightened toggles directly to the frame of the press instead of falling on the main shaft. In the larger sizes the company's new automatic friction clutch is used. Its action is practically instantaneous, avoiding entirely the heavy shock which, in the regular clutches, tends to destroy the clutch parts, frequently causing expensive delays and repairs. The adjustable power presses are specially adapted to cover nearly every kind of blank cutting, perforating, forming and combination die work, covering a large proportion of the operations needed in the manufacture of cans, piced tinware, brass goods, trimmings, &c. In the presses shown there is a knock out attachment for discharging the work from the upper die, thus dispensing with springs, which often prove unreliable. The large double crank press exhibited is intended for operating very large but accurate cutting and perforating dies, as, for instance, for armature rings, and is built very solidly and substantially. The drop hammers shown are of two styles, one being intended for forging, embossing, design stamping and other work requiring the dies to be keyed in the bed, while the other is adapted to sheet metal stamping. The power punching presses, of which such an extensive line is shown, are adapted to nearly every kind of blank cutting, punching, perforat-

ing, forming and bending, covering a large proportion of the operations needed in the manufacture of hardware, locks, cutlery, guns, sewing machines, typewriters and other articles made out of sheet metal. The pitman is made of steel, the crank pin runs in gun metal bushings, and the presses are further fitted with the Stiles eccentric adjustment, permitting rapid and very accurate adjustment and transmitting the pressure entirely through solid metal instead of throwing it upon screw threads; also with a patent graduated adjustment marked to $\frac{1}{16}$ inch, and with the Stiles automatic clutch, which allows the shafts to be turned for setting dies while the wheel is in motion without endangering the operator. In showcases samples are exhibited of the work done by these machines, covering a very great variety of shapes in different metals.

Warner & Swasey

of Cleveland, Ohio, make an interesting exhibit of machine tools at Column J 48, Machinery Hall. Among these is shown the Warner gear generating and cutting engine, which has attracted much attention among mechanical engineers and was the subject of a paper read at the Richmond meeting of the American Society of Mechanical Engineers in 1890. Another machine, made only to order, is an automatic boring and tapping machine for iron and brass work, designed for boring, facing, chamfering and tapping the pipe ends of globe valves, cocks, packing nuts for valves, union nuts and a variety of articles where boring and tapping are required. There are three two-jawed chucks in this machine, which are constructed in the form of a triangular disk. The disk revolves on trunnions between the ends of the four spindles. Two of these spindles carry boring and facing tools; the other two carry the taps. In operation, a valve is placed in one of the chucks and the disk indexed around, bringing the valve into position in front of the boring spindles. While it is being bored and faced a second valve is placed in the next chuck. As soon as the first valve is bored and faced the disk is again indexed, bringing the bored valve into position to be tapped and the rough casting into position to be bored and the third chuck into position to receive another casting. A third indexing of the chuck brings a completed valve into position to be removed and to be replaced by another casting while the other operations are taking place. All the processes are automatic, except the putting in and taking out of the valves and the indexing of the chuck disk. When union nuts or similar articles are to be bored and tapped, two are held in each chuck in place of the valves, as above described. The other machines shown are such as the firm carry in regular stock, comprising a horizontal boring machine, vertical milling machine, revolving turret screw machines, monitor lathes, a forming monitor, universal monitor lathes, hand lathes, a double-head key lathe, cock grinder, two-spindle valve milling machine, &c. The firm also have an exhibit in the Manufacturers Building devoted to telescopes and astronomical work, which includes the great telescope just built on the order of Charles T. Yerkes for the new Chicago University.

Jarecki Mfg. Company

of Erie, Pa., have an exhibit of pipe-threading and cutting tools at Column K 47, Machinery Hall. Their exhibit

is very tastefully arranged, the large threading machines being placed along the sides of the space, while in the rear a pyramid of shelves has been built to hold pipe fittings and specimens of the work done on the machines. A unique arch, formed of threaded cast-iron pipe, fittings and branches, has also been built across the rear, towering above the pyramid. The machines shown are designed to cut and thread pipe from $\frac{1}{4}$ inch to 12 inches in diameter. They are operated in a variety of ways. Some are driven by hand, others by electric motors, some by belt from the exposition power plant and others by attached engines. They are shown in actual use and receive much commendation from pipe fitters for their ease of adjustment, convenient arrangement and good work. The dies are quick-opening and adjustable, each set of four pieces cutting two sizes of pipe. A large assortment of the Jarecki screw plates and pipe cutters is also shown.

One of the features of the exhibit is a showcase containing highly polished specimens of valves, nozzles, oil cups and other goods, arranged in a most attractive manner.

N. P. Bowsher

of South Bend, Ind., has an exhibit of his balancing ways for machine shop use at Column O 38, and of speed or motion indicators at Column B 47, both in Machinery Hall. The first named exhibit is made in conjunction with the McKinnon Pulley Company, manufacturers of Little's separable pulley, Menasha, Wis. Mr. Little's ingenuity has been exercised successfully to make the exhibit attract attention. Separate pulleys, with the detachable portion of the rim removed, are mounted on shafts supported at the ends on the Bowsher balancing ways. A very slight start makes the pulleys oscillate back and forth for an indefinite time, and crowds are thus attracted by what they at first suppose is an exhibition of perpetual motion. The perfect level of the balancing ways and the partly removed rim of the pulley are the essential elements to this quite curious display of protracted motion.

Hill, Clarke & Co.

of Boston and Chicago make a huge collective exhibit at Column K 38, Machinery Hall, of machine tools manufactured by a number of concerns for whom they are selling agents. These comprise an automatic cam-cutting machine, four universal milling machines, two automatic gear cutters, six plain milling machines and a cutter grinder, made by the Brainard Milling Machine Company of Boston; a 15-inch turret lathe with automatic chuck, by Bardons & Oliver of Cleveland; five cutting-off machines, for 2 to 6 inches, by the Hurlbut Rogers Machine Company of South Sudbury, Mass.; a universal grinder, by Landis Bros. of Waynesboro, Pa.; eight lathes, from 14 to 22 inches swing, and a 26-inch planer, by Flather & Co. of Nashua, N. H.; a 26-inch lathe, by the Gleason Tool Company of Rochester, N. Y.; and six upright drill presses, five lathes and one radial drill press, by Prentice Bros. of Worcester, Mass. The Brainard milling machines include one capable of cutting cast-iron $\frac{1}{4}$ -inch deep and 14 inches wide at the rate of 14 inches per minute. A special vise is shown in connection with these machines which can be instantly adjusted to take work of any size from $\frac{1}{4}$ inch up to 5 feet, and which holds the work as near the platen as it is possible to put it. The

Flather lathes have some new features, one of them showing a new method of applying the Slate taper attachment, securing numerous advantages. The 22-inch lathe of this make has plain pulleys for the feed belt and three pairs of gears inside the head for driving the stud, instead of the usual feed cone. The Gleason lathe has a new device for preventing more than one feed from being thrown in, which is thoroughly effective. In close connection with Hill, Clarke & Co. is found the exhibit of

The Hendey Machine Company

of Torrington, Conn., whose new Norton lathe has excited much interest among users of machinery. Three of these lathes are shown—namely, 14, 16 and 18 inch. Without changing gears, this lathe cuts 12 threads and also makes 12 different cuts for turning. When changes of gear are made, each additional change gives 12 additional screws or cuts per inch. Samples of the work exposed, showing several kinds of screws cut on the same bar, arrest the attention of the passing visitors. Since the machines were installed as exhibits an improvement has been made in their operation by two belts being put on instead of one, which enables different feeds to be run and also causes the carriage to go back rapidly without reversing the lathe. This is done by merely throwing the clutch over into the faster motion. Other machines shown by the company are three shapers, from 15 to 25 inches; three planers, from 10 x 10 to 27 x 27 inches, and a 14-inch engine lathe.

Boiler Exhibits.

In the vicinity of Column M, 21 to 28, Machinery Hall, are some interesting exhibits of boiler parts. The Babcock & Wilcox Company of New York, whose boilers will be found in service in the power house, have taken space here for a display of boiler parts. They have erected a fence composed of a section of boiler tubes attached to a header, the headers forming the posts. The exhibits comprise tubes twisted and drawn into double bow knots, sections of tubes hammered flat while cold without cracking, saddles, heads, cast and wrought headers, &c. The cast headers are used for low-pressure and the wrought headers for high-pressure boilers. The wrought header is of such an intricate form that it is regarded with much curiosity by iron workers. A glass case contains a very pretty model of a high-pressure boiler, partially set, so as to show the manner in which such boilers are built. In sharp contrast with this modern piece of work, showing the most perfect boiler made to-day by the B. & W. Company, is the original inventor's model of this boiler. It was made by Stephen Wilcox in 1856, and was the first water-tube boiler with inclined tubes connecting water spaces at front and rear with an overhead water and steam reservoir, producing a continuous round of water circulation by a cross flow of the furnace gases. The model is a very small one, made of tin, but from it has sprung the B. & W. boiler, of which over 1,000,000 horsepower are in use to-day.

The National Water Tube Boiler Company of New Brunswick, N. J., have built a small pavilion which shelters a number of sections of their water tubes, arranged to show the construction of this part of their boiler. Some of the header plates are removed to permit the interior of the headers to

be examined and to show the means by which they are connected. The headers are joined together by nipple which take up the strains caused by a unequal contraction and expansion. The tubes are further perfectly straight between headers, so that they can be easily removed and others inserted. These boilers are also to be seen in actual service in the power house. A handsome model is shown of the company's Standard rocking grate bars. The model is in all respects an exact reproduction of these grate bars in miniature. With their use it is only necessary to open the fire doors when fuel is fed into the furnace. The clinkers are crushed by the bars and drop into the ash pit.

Several specimens of marine boilers are here displayed by Charles Ward of Charleston, W. Va. The boilers of the United States coast defense vessel "Monterey" are of this type. They will be recalled by our readers on account of the severe criticism to which they have been subjected. They passed through this criticism triumphantly, Chief Engineer Melville having written a most explicit denial of the statements that the Ward boilers were injured after the tests were made. These tests, according to his official statement, were the most severe ever applied to any boiler. Some 300 of these boilers are now in use in Government vessels. Several sizes are shown, varying from that used by a launch up to the size required for a large vessel. They are constructed of tubes, set vertically in a cast-steel ring, then bent over in a smaller circle at the top and inserted in another circular steel casting which is riveted to a small dome. The fire chamber is surrounded by the tubes. The special merit of these boilers to shipbuilders and repairers is that they can be wholly built up between decks, so that they can be replaced when worn out without tearing out the decks.

The Niles Tool Works Company of Hamilton, Ohio, make an exhibit of machine tools which is altogether worthy of this great establishment. It is located at J 51, in the extreme west end of the annex to Machinery Hall. The first thing that strikes the visitor's eye here is an immense planing machine, so huge that it occupies almost the entire front of the company's space, while its cross rail towers almost to the rafters of the building. It will plane 12 feet high, 12 feet wide and 30 feet long. There are two heads on the cross rail and two side heads, besides an outside bracket with provision for an extra head, which can be moved from one side housing. The feeds are positive and automatic in every direction, and each head has an independent feed in any direction. The entire machine weighs 270,000 pounds, the table alone weighing 35 tons and being a single casting. Two of these machines have recently been built by the Niles Tool Works Company, one of which is now in operation at the works of the General Electric Company at Lynn, Mass., and the one on exhibition is for a large engineering concern in the State of New York. Turning to the other tools, a 6-foot boring and turning mill is next seen. This machine, swinging 78 inches in diameter, takes in under the tool holders, when the rail is raised to the top, 36 inches. The boring bars have 24-inch traverse. The cone has six steps for a 4-inch belt, and is strongly back geared. The range of feed is from $\frac{1}{32}$ to $\frac{1}{8}$ inch. The table is driven by an accurately cut internal spur gear. The cone transmits power

to a pair of heavy, cut bevel gears, thence to a steel pinion driving the internal spur on the table. This construction insures a steady running machine without chatter, and free from any lifting tendency. The driving cone is placed at the side of the machine, and the belts are as convenient as those on a lathe. Each mill is strongly back geared, giving a wide range of speeds. An annular bearing under the outer edge of the table is provided, and when heavy pieces are to be worked the spindle step is relieved and the table allowed to rest lightly on this outer bearing. Thus adjusted the machine works with all the steadiness of a heavy planer and all the precision of the most accurate lathe.

The boring bars are octagon in section, accurately fitted to their bearings. One bar is brought exactly central with the spindle. This form of bar is very stiff and rigid, and at the same time convenient to handle. The tool holders are steel forgings, arranged to hold the tools in any required position, and may be removed for other tool holders if desired. The bars may be set over at any angle, and are quickly handled by means of worm and worm wheel. They may be fed in any direction independently of each other.

Many attempts have been made to secure a balancing device for the bars that will compare in efficiency and simplicity with the company's patented device. The device, simple as it appears, is worthy of consideration. A single chain is attached at one end to an arm rigidly secured to the rail, and a similar arm on the other end of the rail carries a pulley over which the weighted end of the chain falls. There is a sheave on the face of each tool bar, and each saddle carries two sheaves straddling its bar, and the chain is looped over the single sheave and under the tool-bar sheave. This is a very simple and perfect arrangement, and possesses many advantages not apparent at first sight.

The feeds are operated by a friction disk, and have a range from $\frac{1}{32}$ to $\frac{1}{8}$ inch. The feed is thoroughly reliable and very simple in construction and operation. It may be instantly varied to any degree within its range. At the end of the rail are a pair of gears, by means of which the speed can be increased or decreased 100 per cent. without shifting the friction disk.

The feeds are independent. The saddles or bars may be fed in the same or in opposite directions at the same time. The rail is of box-girder form, with wide bearings. It is raised and lowered by power. The saddles are made right and left, so that they may be brought close together. The right-hand saddle has quick hand traverse by rack and pinion.

A horizontal boring, drilling and milling machine is shown which will bore or drill holes, or mill off any surface 9 feet or more in length by 6 feet in width. The machine consists of a heavy column 10 feet 6 inches high, mounted on a bed plate of any length to suit requirements. The column is moved along the bed plate by power, operating through worm gear and rack. The column is 31 inches wide on the face and is fitted with a heavy saddle 40 inches square, carrying the spindle. The saddle has a vertical traverse on the column of 6 feet and is raised and lowered by a heavy screw. It is balanced by counterweight hung in the column. The boring and milling spindle is of hammered steel, $4\frac{1}{2}$ inches in diameter; it slides in a heavy revolving sleeve and has a traverse of 4 feet. It revolves in either direction, right or left hand, re-

versing by lever conveniently located, and has eight power feeds, ranging from $\frac{1}{16}$ inch to $\frac{1}{2}$ inch per revolution of spindle. It is also provided with hand feed and quick return. The milling feeds are six in number, ranging from $\frac{1}{16}$ inch to $\frac{1}{8}$ inch per revolution of spindle. These feeds are applied only to the column and saddle, and are by power only. Any of these feeds for the quick motion may be utilized to set a drill, boring bar or milling cutter to work anywhere on the surface which the machine will reach. At one end of the bed plate is placed the driving gear, milling feed and quick-traversing mechanism for the column. The quick power traverse for the column has a speed of 5 feet per minute. The driving cone has six steps for 4-inch belt, and is strongly back geared, giving 12 changes of speed, ranging from 2 to 200 revolutions per minute, and has ample power for boring up to 24 inches diameter. A platen is placed in front of the column convenient to the spindle, for the operator to stand on, and all movements of the spindle, saddle and column may be started, stopped and reversed by levers conveniently arranged on and traveling with the saddle, within easy reach of the operator while he watches the work.

A No. 3 screw machine shown has a capacity for $\frac{1}{2}$ inch to 1 $\frac{1}{2}$ -inch screws. Both the cone and face gear are loose on the spindle and are driven, the one by a friction, the other by a positive clutch, connected to a sliding hub splined to the spindle. The friction obviates the shock incident to starting the spindle at a high velocity, as the motion is gradual, while the positive clutch on the face gear insures steadiness of motion under heavy strain.

A 63-inch heavy forge lathe exhibited is a machine of great weight, strength and power, designed for use in forges for rough turning or finishing heavy shafts, rolls, cranks, &c., also for machine shop use where extra duty is required, as in turning or boring large steel castings. It swings 63 inches over the ways and 47 $\frac{1}{2}$ inches over the carriage, and has a bed 28 feet long. It will turn 20 feet between centers. The cone is mounted on an independent steel spindle, with a steel pinion gearing into an internal gear on the back of the face plate. It has five steps for a belt 4 $\frac{1}{2}$ inches wide, and has two sets of back gears, giving 15 changes of speed. The main spindle is 10 inches in diameter at the front end, with a bearing 15 inches long. The face plate is driven on and bolted fast to it. The carriage is 68 inches long and is of a very rigid form. It is accurately fitted to the bed its entire length and gibbed both front and back. The rest has compound movement with longitudinal, cross and angular power feed. The feed mechanism is made in the strongest manner and very rigidly supported in the apron, to enable it to withstand severe duty. The feed reversal is by strong tumbler gearing in the head, so that no change in the stud gear is needed in cutting either right or left hand threads. The lead screw is placed well up under the shear of the bed and the nut so arranged as to bring the strain on the carriage as direct as possible. The tail stock is held down by four bolts and is also provided with a strong pawl engaging with a rack cast in the bed. Thus a positive resistance is offered, preventing all danger of slipping. The pawl is raised or lowered by a hand knob on the side of the tail stock. The upper side of the tail stock is also held independently by four bolts. This arrangement allows the tail stock

to be set over for taper work without unclamping from the bed.

The Brown & Sharpe Mfg. Company

of Providence, R. I., have an exhibit occupying a space too small to permit a display of their annealing or case-hardening furnaces, foundry rattlers, core ovens, polishing wheel stands and other appliances for shop use. Notwithstanding this, they exhibit 40 machines and a full line of the small tools and those of Darling, Brown & Sharpe. Nothing was especially selected or prepared for exhibition and everything is the same in finish and design as they ordinarily keep in stock. We find in a pamphlet issued by the company and entitled "Our Exhibit" a brief description of the main features of the exhibit, from which we take the following:

Five of the machines were never publicly shown before now, 12 more are new since 1880, and 11 others have been more or less radically remodeled. We can only say here, in the way of general description of the new or remodeled machines, that the novel features of the new milling machines are chiefly in connection with the feed and spiral head, the changes in grinding machines render them even more exact than formerly, and the modifications in the gear cutting machines result in greatly increased product. Accuracy and rapidity are the characteristics of the new screw machines. Several of the new machines complete the lines in which they belong. The new millers, for example, make complete series of both universal and plain machines, and the various sizes in one series have corresponding sizes in the other. Other machines, like the automatic screw machines, indicate the extension of our business into new lines. The more distinctive of the new principles have been patented. The cylindrical bearings of all the machines are accurately ground; plain bearings are scraped to surface plates; the important screws are accurately cut, and we have ample facilities for producing exact indexing apparatus and all sizes of spur gears up to 84 inches diameter with the curves of the teeth theoretically correct. The fitness of the machines for the purposes intended is best shown by the class of shops that use them in all parts of the world. They are readily understood, easily operated and not liable to get out of order. In some cases a boy 16 years old can operate four of these machines. Their cost is relatively low, as is indicated by the sales made in countries where the machines are imitated and materials are cheaper than in the United States.

The character of a machine may well be judged from its work, and with this in mind we exhibit a number of distinctive pieces made on the universal and plain milling machines, universal grinding machines, screw machines and gear cutting machines. The rate at which the work is done is shown by the figures on or attached to the samples, and while these figures are decidedly in advance of what was accomplished a few years ago they are not exceptional. In finish the samples are just as they were left by the machines. The machines themselves are excellent illustrations of what they will themselves produce. The milling machines were largely made on milling machines, the universal grinding machines have a share in the work on almost every machine in the exhibit, and all the spur gears shown were cut on our gear cut-

ting machines. No indications are given of our facilities for planing bevel gears up to 48 inches diameter.

Specially noticeable is the increase in the number of stock cutters. Four years ago there were several varieties less than now, and less than one-half the present number of screw slotting cutters, one-quarter of the side milling cutters and end mills, and only one-fifth of the present number of milling cutters. Cutters, indeed, are a prominent feature of our exhibit, and the representation includes complete lines of milling cutters, angular cutters, side milling cutters, screw slotting cutters, metal slitting saws, special cutters for grooving taps, cutters for grooving taps and reamers, cutters for spiral mills, cutters for making straight fluted twist drills, cutters for making twist drills, end mills, T slot cutters, convex and concave cutters, cutters for miter and bevel gears, and involute and epicycloidal gear cutters. In this exhibit one of the formed cutters is 9 inches diameter, $4\frac{1}{2}$ inches face, and one of the milling cutters is 6 inches diameter and 24 inches long—perhaps the largest cutter ever made in a single piece. Thirty-two sizes of micrometer calipers are exhibited, and a number of improvements may be noted in and among the well-known standard rules, hardened try squares, straight edges, protractors, vernier calipers, depth and height gauges, wire gauges, and other articles which Darling, Brown & Sharpe regularly manufacture.

Other notable objects in the exhibit are one of our master surface plates, 36 x 68 inches, a 96-inch straight edge and a machine which measures variations of 0.00001 inch. These are interesting not only in themselves, but as suggesting the character and extent of our shop appliances. With this purpose we exhibit a section of our standard work bench, and we use for the overhead works the same style of hangers that are used throughout our works. The stability and convenience of a bench contribute more to good and economical work than is perhaps ordinarily appreciated, and one of the leading tool makers of Europe bought, for reproduction in his works, the sample of the bench we sent to Paris. The economy of the hangers is shown by the fact that from August, 1891, to August, 1892, it required only about 30 gallons of "cosmoline," an oil costing about 60 cents a gallon, to lubricate all these bearings. We had 537 main line hangers and 2191 countershaft hangers, a total of 2728 in all. These hangers require attention only once a year.

Kieselguhr, which is nearly pure silica, has also been recently molded into fire bricks; and bricks made of this material are now being introduced into this country by a North London firm. They are very light, and are nearly as infusible as quartz. The special character of kieselguhr renders the brick porous and consequently increases its non-conducting properties.

E. R. Landgraf, consular agent of Bloemfontein, Orange Free State, reports under date of July 1 that great excitement has prevailed there for the last week. A diamond of 971 carats, valued at £200,000 (\$1,000,000), has been found in the Yagersfontein diamond mine. The stone is $8\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches broad and $1\frac{1}{2}$ inches thick. It is supposed to be one of the largest diamonds in the world.

The Foundrymen's Association,

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club, in Philadelphia, on Wednesday, September 6. The president, Francis Schumann of the Tacoma Iron & Metal Company, Philadelphia, occupied the chair. The minutes of the last meeting were read and approved. The secretary announced that no meeting of the Executive Committee had been held since the last meeting of the association, consequently there was no report on the table from that committee. R. A. Register of Register & Sons, Baltimore, representing the cast-iron soil-pipe section of the Price Committee, reported progress. He stated that it was probable that there would be a meeting of manufacturers in that line held in New York very shortly for the purpose of discussing the business situation. In regard to the situation he remarked that about 80 to 40 per cent. of the foundries were shut down.

E. E. Brown of E. E. Brown & Co., Philadelphia, representing the sash-weight section of the committee, reported that there was no noticeable change. There seemed to be plenty of orders ahead, sufficient to keep concerns going until the end of the year.

S. G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia, representing the small gray-iron castings section of the committee, had no report to make. Business in this section remained unchanged.

P. D. Wanner of the Mellert Foundry & Machine Company of Reading, Pa., representing the cast-iron water and gas pipe section of the committee reported that foundries were all running, but products were being sold at about cost price. The demand this season for cast-iron pipe had been simply unprecedented and yet it seemed that the capacity for the manufacture of the pipes far exceeded what was warranted by the demand.

The secretary, Howard Evans, brought up for discussion the subject of an arrangement for chemists' services at low rates for the benefit of members of the association. He believed that the value of a chemist's services to a foundryman made the subject of importance. Chemists' services were expensive and the necessary chemical materials added to the expense. The question to consider was whether it would be advisable for the association to employ a chemist at a regular salary and to equip a laboratory. Mr. Molin, a chemist from New York, had appeared at the last meeting of the association in support of a plan which he submitted as embodying the requirements of founders in general, and providing for determinations at small cost to members of the association. In the course of conversation with members he learned that such of them as had large foundries employed chemists, but the majority of members were without assistance of this kind. He stated that he had been in correspondence with the Drexel Institute of Philadelphia on the subject of facilities for making chemical tests, and had received a letter from Prof. MacAlister of that institution, in which that gentleman expressed his intention of talking the matter over with his brother professors, and his belief that they would be willing to equip a laboratory and make determinations at a very small cost.

The secretary also read a letter from Mr. Spangler of the department of

chemistry in the University of Pennsylvania, in which he stated that he believed it would be possible to make arrangements for the furnishing of determinations by his department, and that he would do anything that was possible in order to have such work done at the university. He further stated that a consultation with the management would be necessary, and as soon as the matter was in shape he would arrange for an official interview. After considerable discussion the matter was referred to the next meeting of the association, by which time details would be forthcoming.

The secretary called the attention of the meeting to an editorial in *The Iron Age* of August 24 last, detailing "A Plan for the Rapid Development of the Foundrymen's Association," a paper submitted by Thos. D. West of Sharpsville, Pa., to the Western Foundrymen's Association, and making valuable suggestions as to the conduct and location of associations. In this connection he stated that he had received a letter from Mr. Sharp asking that the subject be taken up by this association.

A discussion then took place on the advisability of holding a regular or special meeting of the association in New York, for the purpose of increasing the membership in that section. The secretary reported that he had written to one or two members in New York asking whether it would be possible to arrange for a place of meeting at small cost, and that his letters had been brought to the notice of the American Society of Mechanical Engineers, with the result that that society offered the use of its auditorium for a first meeting without charge, and intimated that in case of meetings in that city becoming a regular feature, a permanent engagement could be entered into on satisfactory terms. After the expression by several members of their views the subject was deferred to the next meeting, when it was hoped the attendance would be larger, and the secretary was instructed to write the secretary of the society thanking him for the society's kind offer and informing him that the matter was in abeyance.

The secretary then read a long communication from John E. Frye of Pittsburgh to a member of this association in regard to the employment by the association of a practical and experienced founder, in conjunction with a chemist, for the purpose of making tests and according information to members on all points connected with foundry practice.

The communication was ordered to be filed.

Mr. Wanner said that he was of the opinion that a good subject for discussion at an early meeting of the association would be "the time for payment of wages." Certainly he said, at the present time, when premiums had to be paid for currency, the subject was an important one. He said he was prepared to move that the Executive Committee take up the subject. After some discussion the opinion of the meeting seemed to be that the question was one largely governed by local customs and that it would be impossible to institute a regular pay day to suit all sections.

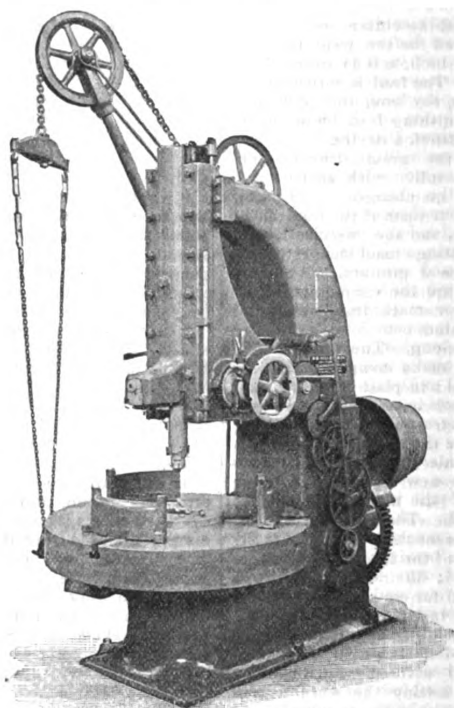
The president brought to the notice of the meeting the requirements of Section 24 of the new Building Law for Philadelphia, approved June 8 last, which section he stated demanded more than passing attention. He read the section, which is as follows:

"Before any iron column, post, beam, lintel or girder, intended to support a

wall built of brick or stone, or any floor or part thereof, or to span any opening, 8 feet or over in width, in any building hereafter to be erected or altered, shall be used for that purpose, the manufacturer or founder thereof shall have a distinctive name or title, properly stamped, rolled or cast, in a conspicuous place thereon, and no greater weight shall be placed on any column, post, beam, lintel or girder than the published tables of said manufacturer or founder show it to be capable of sustaining with safety. The inspector may require columns to be drilled for inspection." This section, he explained, left room for a diversity of opinion as regarded the weights different columns would sustain. One manufacturer might declare a piece of work capable of sustaining 100 tons, while another might

The Sellers Car-Wheel Boring Mill.

Master mechanics of a railroad shop are well aware of the fact that more time is often consumed in getting ready to bore a car wheel—namely, in the preliminary operations involved in setting the wheel in the chuck and truly centering it—than in the actual work performed by the machine. All the modern mills are so constructed that the time of rough boring, finishing and facing the hub of the wheel is reduced to a minimum; but the machine here illustrated is designed to save the time heretofore lost in setting, centering and removing the wheel from the mill, by making these operations practically automatic. The result of this has been to not only



THE SELLERS CAR-WHEEL BORING MILL.

declare that it would sustain 1000 tons, and therefore great confusion in the preparation of estimates would result as well as the possibility of accident. He thought this association should publish a table based upon standard tables, which table should be adopted as the standard for observance by all founders. J. S. Stevens of John S. Stevens & Sons, manufacturers of structural iron work, Philadelphia, was of opinion that the plan suggested by the president was a good one, and that the association should take up the matter as being of importance to every foundryman. After discussion the matter was referred to the Executive Committee.

The meeting then adjourned.

An exhibition of mining and metallurgical appliances is to be held at Santiago, in Chili, next year, opening March 15. Any information in regard to it can be obtained from Señor Julio Perez Canto, secretary of the Sociedad de Fomento Fabril, Santiago.

increase the capacity of the machine but to reduce the labor and responsibility of the attendant and to remove altogether the liability to error on his part in truly centering the wheel. These results are secured by means of a self-closing universal chuck on the table, so arranged that the act of starting the machine causes the chuck to close upon the work and hold it securely in the true position for boring. *Per contra*, the stopping of the table automatically opens the jaws and releases the work.

The time heretofore lost in the gradual stopping of the rotation of the table is also saved, as in this apparatus the table may be stopped instantly, without shock, by the simple movement of a hand lever.

An unusually stiff boring-bar, with double cutters having four cutting edges, insures quick and accurate boring of wheels which are hard in the hub, a common source of trouble in less powerful machines. The value of the double cutter, with its four cutting faces, has been demonstrated by years

of use, and the simplicity of the locking device on this mill, permitting, as it does, change of cutters without loss of time, will commend itself to the practical mechanic.

The special crane designed for and attached to this mill is a convenient auxiliary, and contributes to the increased speed of the machine and decreased labor of the attendant.

The mechanism of the crane is such that when the wheel is raised to the proper height for swinging on the table the hoist automatically stops, and when the attendant has swung the wheel into position it gently drops into its seat. The table is then started; the jaws of the chuck at the same moment close toward the center and hold the wheel in true position; the boring bar with the double cutters descends through the hub, and the hole is rough bored; the boring bar quickly rises clear of the wheel, the finishing cutters are immediately substituted for the roughing cutters, and the true hole is completed in a few seconds. The feed is varied as required, from a fine roughing cut to a five-eighths finishing feed, by means of an adjustable friction device.

Owing to the great stiffness and power of this mill, quick speeds may be uniformly maintained, irrespective of the varying temper of the iron in the wheels, an advantage which lighter mills do not possess, and the very common annoyance of springing of the boring bar and displacement of the cutter by "hard spots" in the hub of the wheel is obviated.

The constant tendency of modern railway practice is toward enlarging freight cars and increasing loads; this has necessitated remodeling the wheels, increasing their weight and enlarging the size of the axles; this, in turn, requires more powerful boring mills than those which formerly sufficed, and this boring mill has been designed not merely with the view to increased output at the present time, but to meet the requirements of the future.

The table is 50 inches in diameter, and is adapted for car wheels up to and including 43 inches in diameter. The chuck jaws, of steel, are arranged to grasp a wheel in six places, thus automatically and without adjustment by the operator setting the wheel much more correctly than is possible in an ordinary three-jaw chuck without very careful adjustment. The power feed is operated through a self-clamping friction device, so arranged that the operator can with one hand adjust the feed by a single motion of a lever to any amount, from the finest roughing feed to the coarsest finishing feed. The boring bar is held by a counterbalanced slide with rectangular bearing surfaces and of massive size. The teeth in the table are of heavy pitch, and are driven by a steel bevel pinion. The table is supported on flat ways and guided by a center spindle.

Convenience has been carefully studied in designing this machine and all the operating handles are brought to the front of the machine, so as to be easily accessible to the operator without moving from one position. This mill is built by William Sellers & Co. (Incorporated) of Philadelphia.

The Lodge & Davis Machine Tool Company have adopted heroic measures to meet the requirements of the present financial stringency. For the purpose of raising spot cash they began on September 6 to sell by auction their great stock of new and second-hand machine

tools at their Chicago store, 68 and 70 South Canal street. Some 21 carloads of machinery were transferred from their works at Cincinnati to the Chicago store to be sold in this way. It is stated that the stock thus offered amounted to \$200,000. The machines on exhibition at the World's Fair were also to be included in the sale. The tools consist of engine lathes, iron planers, shapers, upright and radial drills, milling machines, bolt cutters, monitor lathes, screw machines and brass-working machinery. Buyers were attracted from all over the country, and the early sales made ran up to important dimensions. The company do not propose to retire from business, as reported, but mean to continue. The sale will proceed from day to day until the stock is disposed of or buyers fail to appear.

THE WEEK.

The total pack of the Frazer River, (B. C.) salmon canneries this year amounts to the enormous quantity of 20,500,000 pound cans, or 425,200 cases of 48 cans each. The weight of the pack aggregates 10,000 tons.

The French Minister of Agriculture estimates that nation's wheat crop of the year at about 278,000,000 bushels, being 32,000,000 bushels less than last year. Compared with the estimates of consumption, this leaves a deficit of very nearly 52,000,000 bushels to be supplied to France from foreign sources.

The New York and New Jersey Bridge bill, which passed the House last session, but failed to get through the Senate, has been again presented to the House, and is being pushed vigorously, with every prospect of success.

The annual review of the cotton crop, published by the *Financial Chronicle*, shows the total yield in the United States for the year ended September 1 to have reached 6,717,412 bales, while the exports were 4,402,890 bales, and spinners' takings 2,481,015 bales, leaving a stock on hand of 243,571 bales. The yield shows a considerable falling off from the figures of the two previous seasons—namely, 1891-92, 9,088,707 bales, and 1890-91, 8,655,518 bales.

A bill has been introduced into the House by Congressman Fithian of Illinois, chairman of the Committee on Merchant Marine and Fisheries, providing for the free admission to American registry of ships built in foreign countries.

President Samuel Monroe, at the annual Congress of British trades unions, held last week in Belfast, Ireland, put the matter of labor strikes in a true and sensible light when, in his opening speech, he characterized them as only the "forlorn hopes" of working people, and denounced such action as the height of folly in cases where the resources of civilization had not been exhausted in efforts to avoid the use of these extreme measures.

An Engineering Council has been formed in Japan, whose duties will consist in advising the Minister of Home Affairs upon all engineering matters.

A party of 52 skilled French artisans, who arrived in New York by the steamer "La Gascogne" on Sunday, have been sent by their Government to visit the World's Fair and to witness the working of American industries generally, as well as to inquire into the organizations of American labor. Among

the number is M. Isidor Finance, Second Secretary of the Department of the Interior, and head of the labor department of Paris. M. Finance is a ship painter by trade. The party proceeded to Philadelphia, from whence they will go to Chicago, visiting Pittsburgh *en route*, and subsequently proceeding to various other manufacturing centers of the country.

A dispatch from Milwaukee, Wis., states that the number of unemployed workingmen in that city is much smaller than was supposed. This is particularly true of skilled mechanics, even those employed in the building trades. The number of common laborers out of work is said to exceed the unemployed mechanics of all kinds. On the basis of the figures secured from unions and elsewhere it is estimated that the number of unemployed mechanics in the city reaches 4000. The number of unemployed laborers is thought to be a trifle larger.

On Monday the Public Relief Committee of Chicago took its first step for the relief of the unemployed labor in that city by setting 2000 men to work on leveling and cleaning streets at \$1 a day.

Announcements of forthcoming international exhibitions come in with great frequency. Recent European advices state that an international and colonial exhibition will be opened on May 1, 1894, at Lyons, France. The arrangements are under the management of the Lyons Chamber of Commerce, which has addressed the necessary invitations to the Chambers of Commerce of foreign countries. The Constantinople International Exhibition will, it is announced, open in two years time, according to the intentions of the Turkish Government. The site has been selected, and the general plan adopted is somewhat similar, though on a smaller scale, to that of the Paris Exposition of 1889.

From the annual summary issued by "Lloyd's Register" of vessels of all nations totally lost, condemned, &c., in the past year, the following table is compiled, which, however, includes only vessels—steam and sailing—of over 100 tons:

	No.	Tons.
Steel vessels.....	55	87,498
Iron vessels.....	201	225,422
Wood and composite.....	755	302,304
Total.....	1,008	625,224

For a few of the chief shipowning nations, the percentage of vessels lost to the total tonnage owned is as follows:

	Per cent.
United Kingdom.....	2.11
British Colonies.....	4.12
United States.....	3.01
Austria-Hungary.....	3.98
Danish.....	1.69
French.....	3.54
German.....	2.31
Norwegian.....	4.59

The big Cunarder "Campania" has again lowered the eastern record—her own—by her last run of 5 days 14 hours and 55 minutes from Sandy Hook to Queenstown.

The Governing Committee of the New York Stock Exchange has tendered a vote of thanks from that body to the Associated Banks of New York for their able and enlightened conduct of financial affairs during the late trying crisis, a well-earned recognition of the part played by the leading financial institutions of the Eastern metropolis.

Baltimore's municipal authorities have ordered a tax of \$2 to be levied on each telegraph, electric light and telephone pole in the city.

The Iron Age

New York, Thursday, September 14, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
 CHAS. KIRCHHOFF, - - EDITOR.
 GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
 RICHARD R. WILLIAMS, - HARDWARE EDITOR.
 JOHN S. KING, - - BUSINESS MANAGER.

The Future of the Steel-Rail Trade.

A conspicuous steel manufacturer who has been interviewed lately on his return from Europe has drawn a very gloomy picture of the future of the steel-rail trade. His principal argument seems to be that the amount required for renewals of old lines is annually becoming less and less, as those lines are now practically all laid with steel. He is credited with the statement that the steel-rail trade must depend more and more upon new lines and extensions of old lines. We believe that this is an entirely erroneous view of the situation. As a matter of fact, the requirements for renewals have been the most important source of consumption for many years, and it promises to grow in that respect in the future. The replacement of iron by steel has not been a leading factor for years, the principal consumption being that due to the substitution of new steel rails for steel whose service in the track has been exhausted or for good steel rails too light to bear the heavier traffic imposed upon it.

A few figures will show that the position ascribed to Mr. Carnegie is untenable. Let it be assumed that the average requirement for a mile of new railroad, including its proportion of sidings, is, roughly, 100 gross tons. Deduct from the production of steel rails the quantity thus used. The balance represents the requirements for renewals. From the total production of rails we have first deducted the quantities which were made for street railroads. The following table covers the years 1889 to 1892:

Year.	Production of rails. Gross tons.	Used for new roads. Gross tons.	Renewal requirements. Gross tons.
1889.....	1,458,297	518,400	939,897
1890.....	1,788,778	534,900	1,251,878
1891.....	1,225,874	389,900	835,974
1892.....	1,440,354	446,700	993,554

Surely this does not look as though new mileage were the salvation of the rail producer. Nor has the disappearance of the old iron rail very much to do with renewals. "Poor's Manual" has for years shown how many miles of track in the United States are still laid with iron rails. According to these returns the number of miles by which the iron track has disappeared was as follows. We place alongside of these figures the approximate renewal requirements figured out in the above:

Year.	Reduction of iron track mileage. Miles.	Renewal requirements. Gross tons.
1889.....	1,917	939,897
1890.....	9,817	1,251,878
1891.....	840	835,974
1892.....	838	993,554

Although iron rails were displaced by steel on nearly 8000 miles of track more in 1890 than in 1889, the consumption for renewals jumped only 320,000 tons, and although it dropped back nearly 9000 miles the next year, the renewal requirements fell off only 420,000 tons. Let it be noted that although less than 1000 miles of iron track disappeared in the two years 1891 and 1892, there were put into old roads over 830,000 tons of new steel rails in 1891 and very close upon 1,000,000 tons in 1892.

We believe that these figures prove pretty conclusively that the steel rail trade need not look with dismay upon the disappearance of the old iron rail as sure to rob it of much of its employment, nor need the makers depend upon the builder of new roads as their principal customer. The renewals of worn-out and light steel rails have been the main reliance in recent years and will be until the next railroad-building craze. The normal renewal consumption of the United States is between 800,000 and 1,000,000 tons, and is likely to grow slowly rather than to decrease.

The New Tin-Plate Decision.

Solicitude for the welfare of established manufacturing industries has been manifested in a notable instance by the new national administration. Its political opponents have been steadily asserting that manufacturing interests will suffer seriously from hostile legislation and from the interpretation of tariff provisions in the interest of importers. The hostile legislation may come, as that is wholly for the future to decide, but the new tin-plate decision rendered on the 5th inst. is explained by the officials of the Treasury Department to be intended for the conservation of an important domestic industry threatened with extinction by the encouragement hitherto offered to competing products from abroad. In carrying out the requirements of the McKinley tariff act, it has been the rule of the official statistician of the Treasury Department to include in his figures showing the product of American tin plates all tinned plates made from imported black plates. As our readers are aware, these statistics are collected from the tin-plate manufacturers to enable the Government to ascertain whether in any year prior to June 30, 1897, the quantity of tin plates manufactured in the United States "lighter than 68 pounds per 100 square feet" shall equal one-third of the quantity of such plates imported and entered for consumption during any one fiscal year after the passage of the act. If the domestic manufacture falls short of this limit, the act provides that tin plates shall be admitted duty free after October 1, 1897. It was found very soon after the passage of the act that the facilities for tinning plates were increasing much more rapidly than

the production of black plates for tinning, and the deficiency had to be met by importing plates. The question arose as to whether such plates should be counted in the Government returns and it was decided in the affirmative. The new decision, made on the 5th inst., gives the following instructions to Ira Ayer, the statistician:

You are informed that after careful consideration of the matter the Department has come to the conclusion that the word "produced" which appears in the second proviso of paragraph 143 of the tariff act of October 1, 1890, was intended by Congress to exclude from the computation of results all tinned plates made from imported black plates.

Now, it would appear at first sight that this decision was made for the purpose of restricting the figures of the production of tin plate as much as possible. The manufacture of tin plate in this country is progressing with such rapidity that it is claimed that, counting in tinned plates made from imported black plates, the required proportion of one-third of the importation in any one year has already been reached. This would be somewhat embarrassing to those members of Congress who desire to be fair and to live up to contracts. It would relieve them greatly if they were told authoritatively that the rapid growth of the American tin-plate industry was all a mistake, that it had grown only one-half or one-third as fast. But from the side-light thrown on this decision by dispatches from Washington, we learn that Assistant Secretary of the Treasury Hamlin had made the remarkable discovery that the American iron and steel sheet industry was being "crushed" by the competition of foreign black plates brought here for tinning. The admission of such plates, "merely dipped in this country," into the statistics of American tin plate has put such a premium upon importations that they advanced during the last fiscal year to 91,247,002 pounds, against but 32,448,322 pounds in the previous fiscal year. Mr. Hamlin contends that it could not have been the purpose of the McKinley act to crush our sheet industry, and therefore the Treasury Department withdraws this "encouragement" to import black plates for tinning.

This deep interest in their well-being probably ought to be received with profound gratitude by the American iron and steel sheet manufacturers. It certainly cannot be very pleasant for them to know that such immense quantities of sheets are being imported by the tin-plate manufacturers. This business should be in their hands and not in the hands of foreign sheet makers. But we are of the opinion that they do not share the solicitude of Mr. Hamlin for the safety of their established business. So far we have heard not a single protest by an American sheet manufacturer against the purchase of foreign black plates for tinning by American tin-plate makers. If Mr. Hamlin has received such a protest, the name of

the party should be published as a curiosity. The importation of black plates for tinning is unavoidable at present, and every sheet manufacturer knows it. More and more sheet mills are being built, however, for the manufacture of these special plates. In the course of time, if the tin-plate industry is not destroyed, and duties on sheets are retained, the facilities of the domestic manufacturers of sheets will overtake the demand for black plates for tinning and the importation will then be stopped.

The Assistant Secretary has been misled. The people who are really hurt by the importation of black plates for tinning are the foreign manufacturers of tin plate. Every black plate brought here and tinned on American soil displaces a tin plate wholly made abroad. They are the ones to protect and not the American sheet manufacturers.

The wonderful vitality of the iron and steel sheet business has been forcibly illustrated during the past two months of depressed trade. Bar mills and guide mills have almost without exception been idle during that time throughout Ohio, and very little has been done in that line in other States. At the same time several sheet mills commenced operations about the middle of August, and the number has daily increased until at least 40 light sheet mills are known to have been in operation last week in Ohio, Indiana, Kentucky and Western Pennsylvania, some of them running two turns and others three turns during 24 hours. This does not include tin mills. Those included are mills making light sheets from No. 18 to No. 30 gauge. The total product of these mills for the week ending September 9 would be not less than 2000 tons. The principal uses to which this material is put are roofing, galvanizing and stove pipe, large quantities being used for stamped goods, kitchen utensils, stoves, and a great variety of purposes.

The Chicago Steel Works Trouble.

At Chicago, on the 6th inst., the Circuit Court was petitioned to appoint a receiver to wind up the affairs of the Chicago Steel Works, which is alleged to be insolvent and has ceased doing business. The complainants are the Illinois Steel Company, and represent that they are creditors to the extent of \$20,000. The Chicago Steel Works, according to the contents of the bill, were organized in 1878 with a capitalization of \$20,000. In 1893 an effort was made to increase the capital stock of the concern to \$100,000, but the plan was never legally carried out. In that year the directors are charged with having declared a dividend of 400 per cent. on outstanding stock for the purpose of increasing the capital stock. The defendants declare that the act was fraudulent because the profits of the company had not been sufficiently large to declare a dividend of that nature. It is claimed that the assets of the defendant company are less than half the liabilities; that the directors, Roswell H. Ebeneser, Edward H. and John Buckingham, are of the same family and manage the affairs of the company hostile to the interests of the commercial creditors. On the showing made Judge Baker

granted an injunction restraining the defendant company from placing liens on the property favoring preferred creditors.

The Chicago Steel Works, up to this year, operated a rolling mill at Noble street and North avenue, Chicago, making a specialty of agricultural shapes. Deciding to remove to a better location and to enlarge their facilities, they secured a site at Chicago Heights, and a land association erected buildings for them. Much of the machinery had been removed to the new location when the financial stringency prevented new stockholders from fulfilling their engagements and the work came to a halt, with no complete facilities for manufacturing at either place. In this unfortunate plight they have been unable to meet maturing liabilities.

CORRESPONDENCE.

Observing Temperature in Blowing Steel.

To the Editor: The letter of H. H. Campbell in your issue of 7th inst. considerably modifies a statement in your abstract of his valuable paper on "The Open Hearth Process," published in your issue of August 24, relative to the ability of the steel blower to read conversion temperature in Bessemer practice, which the undersigned questioned in a communication you kindly published on 31st ult. The modification is a reiteration of Mr. Campbell's statement in full, unaffected by the abbreviation incident to an abstract, and, as far as it goes, places Mr. Campbell and the undersigned on the same ground in discussion, but does not gainsay the fact that the accuracy claimed by Mr. Campbell is not common to the average steel blower, nor the other conclusion of the undersigned that the blower should not be assured—by so trustworthy an authority as Mr. Campbell—either that he has the degree of skill indicated, or that such measure of skill is necessary to successful work, and, inferentially, that failure would follow the lack of it.

While the writer assumed the blower's field of operation to include the entire range of temperatures experienced under the varying metallurgical conditions obtaining at the many shops he is privileged to visit, Mr. Campbell narrows the temperature conditions to one where the range is so accurately controlled by the fine work of the blast furnaceman and the shop metallurgist that the iron coming to the converter requires—in a charge of 12,000 pounds—from none, to say 700 pounds of scrap to keep the temperature approximately right. Under such conditions a multitude of blowers would be in harmony of judgment, and the blower who worked under such conditions constantly would be complimented on having a "pudding," but place him where irons require from 1000 pounds minus to 8000 pounds plus of scrap necessary, and he would fall to rise to the occasion. Such conditions are quite common, for reasons that need not be stated, and most excellent steel is made thereunder; but very cold, as well as very hot heats result, bringing their accompanying train of evils, and, while general conditions necessitate these irregularities in materials, no good can result from predicating failure in the absence of close temperature reading.

Mr. Campbell justifies his claim: "That the difference caused by a vari-

ation of 100 pounds either way, in such an addition, can be seen by the naked eye," by this added one: "I claim that, by using blue glasses alone, and looking only at the steel as it was poured from the vessel into the ladle, I could tell the change of temperature caused by a variation of 100 pounds of steel scrap." Accuracy of temperature reading at this point in the operation is not in question, which relates only to judgment of temperature during conversion, and sufficiently long before its end to apply a corrective if needed. It is, however, a measure of Mr. Campbell's superior skill, alas! far and away above that of the average blower, who, after his steel is poured, takes note of other more comprehensible phenomena than the tint of the fluid stream of metal to guide him in his next effort. The steel in the ladle has passed beyond his control.

To-day, in one of the important steel shops of this city, the writer asked its superintendent, who had been watching a heat with his glasses, whether or not the temperature was right? He replied: "It would have carried 300 of scrap." A little later, when the heat was being poured into the molds (bottom cast), he saw evidences which caused him to say: "That heat was about right after all." This incident sustains Mr. Campbell's position, in so far that when the temperature is nearly right, fine deductions can be drawn as to the effect of cooling additions; but the case has nothing in common with one in which a hot-blowing charge requires scrapping, or where one that would finish too cold would require iron to be burned to supply the needed calories.

Leaving the difficulties of direct metal operations out of the question, and considering only irons from cupola, it is not uncommon at any works doing remelting that the metals may be entirely of pig iron of proper chemical composition, or be a mixture of pig and scrap to meet the requirements. If a charge containing about 1.50 per cent. of silicon is made up exclusively of pig of that content, the total carbon content going to converter will be over 4 per cent. Another charge made up of pig containing about 2.50 per cent. of Si. and steel scrap in proportions to bring the Si. to 1.50 per cent. will have a total carbon content of about 2.50 per cent. Assuming that all other conditions are similar, and that the silicon content of the former is just sufficient to finish the heat at the proper temperature, the latter (low carbon) charge will finish too hot, but in the limited time allowed the blower to determine this fact, if he trusts to the naked eye, he will be deceived if blowing this mixture right after the other (the converter-phenomena of the two being so different), and thus prove that it is more by keeping in touch with the phenomena of preceding conversions for closely approximate temperatures that he is guided, than by any actual sight reading of gaseous converter products within his control. Mr. Campbell grants entirely too much when he credits many others with having his exceptional abilities in this refinement of temperature reading.

JNO. E. FRY.

5417 PENN AVENUE, PITTSBURGH, PA., September 8, 1898.

A computation made by *Engineering* shows that to patent an invention throughout the world costs nearly \$14,000, there being 64 governments which have separate patent laws.

The Tariff Hearing.

There was a large gathering of leading iron and steel manufacturers on Monday to attend the hearing before the Ways and Means Committee, among those present being Joseph Wharton of the Bethlehem Iron Company and connected with other iron interests in Eastern Pennsylvania and New Jersey; F. W. Roebbling of J. A. Roebbling's Sons' Company, Trenton, N. J.; Cyrus Elder of the Cambria Iron Company, Johnstown, Pa.; W. R. Stirling of the Illinois Steel Company; G. M. Laughlin of Jones & Laughlins, Pittsburgh, Pa.; David Reeves of the Phoenix Iron Company, Phoenixville, Pa.; W. C. Cronmeyer of the United States Iron & Tin Plate Company, Demmler, Pa.; John Lambert of the Consolidated Steel & Wire Company, Joliet, Ill.; Thomas Seddon, Sons Iron & Steel Company, Birmingham, Ala.; A. M. Shook, Tennessee Coal, Iron & Railroad Company, Nashville, Tenn.; H. S. Chamberlain, Roane Iron Company, Chattanooga, Tenn.; Chas. L. Gilpin of W. Dewees Wood Company; P. H. Laufman of Apollo, Pa., and James M. Swank, secretary of the American Iron and Steel Association of Philadelphia.

The proceedings were opened somewhat tardily, although the delegation was long ready, by Joseph Wharton, who spoke as vice-president of the American Iron and Steel Association, which, as he explained, was no alliance, no league, but whose chief function was to collect statistics. Mr. Wharton stated that the magnitude of the iron industry is rarely appreciated. There are employed in it 450,000 persons, representing a population of 2,250,000 when the usual ratio of five to one worker is accepted. This includes the miners of iron ore and the producers of coke. Mr. Wharton urged that consumers are also interested in maintaining this great industry, since it insures to them that they will procure goods at lower price and of better quality. Mr. Wharton insisted that the present tariff is the best which we have had, and that no noxious changes are wanted. Great manufacturing plants are of slow growth, and anything which cripples them is a matter of very serious general concern. He stated that the threat that the tariff would be assailed had caused the withdrawal of credit, so that within the last few months 98 iron manufacturing concerns had suspended. He insisted that since foreigners pay for the privilege of selling in our market, deducting the duty from the price which they receive, this method of raising revenue is the fairest to our citizens.

When dealing with the question of a preference between ad valorem and specific duties, Mr. Wharton pointed out that the former led to undervaluations, and that therefore duties should be specific. American manufacturers have no proposals to make concerning rates of duty, because they are satisfied with those now existing. They protest against any change.

Mr. Wharton was subjected to a long examination by different members of the Ways and Means Committee, in the course of which he was asked whether patents now control certain branches of the trade. He alluded to a German treatise in which the effect of a tariff had been minutely and scientifically investigated. A division of three classes was made for articles, one which was free, a second aided by some duty, and a third in which there was adequate

protection. The investigation showed that production in the first class has dwindled. It had decreased in the second, but for that class in which there was an adequate duty production had been so cheapened that an overflow into foreign markets was possible.

Mr. Wharton contended that manufacturers do not want absolute barriers erected; all that is asked is that American producers be placed on such terms as against their foreign competitors that they have a fair advantage. They do not want exclusion. They want stimulating, not destructive competition.

Mr. Wharton protested against the Labor Commissioner's figures of relative cost of steel rail manufacture in Europe and America as untrue.

In discussing the basis of equality with foreign producers, he held that it should not alone take into account the differences in wages at home and abroad, but also the higher interest on money borrowed and on capital invested. Mr. Wharton explained at length that inevitable conditions prevailing in this country demand that manufacturers pay higher rates of interest on money borrowed and on capital actually invested in plant because it needs greater inducements to secure capital. The risk element is greater. In this connection the statement was brought out that in our iron industries watered stock is very rare.

The talk then drifted off to the relative efficiency of European and American labor, in the course of which Mr. Wharton explained that in the iron industries there are no such differences as are often claimed. He does not believe in pauper labor, and held that, aside from less of the fancy side of living, foreign iron workers are well nourished. He acknowledged that while the American workman has more ambition and larger opportunities, this is not exclusive, but is enjoyed in a measure by men abroad.

G. H. Ely of the Western Iron Ore Association filed a document bearing on the iron ore mining industry. Mr. Ely described the present condition of iron mining on Lake Superior, stating that this year's production would not probably be more than 5,000,000 tons, against 9,000,000 tons last year. Out of about 100 producing mines, probably not over 25 per cent. are now at work. Mr. Ely gave the following statement of the capital invested in the business: Mines, \$71,500,000; cost of shipping docks, \$10,885,000; cost of railroads from the mines to the shipping docks, \$37,000,000; value of vessels in the ore-carrying trade, \$32,000,000; cost of docks at receiving ports, \$12,000,000; cost of railroads from ports to iron manufacturing districts of Central Ohio and Western Pennsylvania, \$26,000,000; Total, \$182,000,000. Mr. Ely referred to the wages paid in foreign and home mines, and to the facilities of foreign producers.

After recess W. R. Stirling of the Illinois Steel Company stated that his company had \$30,000,000 capital invested and employ 9500 men, to whom in 1892 wages to the amount of \$6,522,000 were paid. On October 1 there will be only 1100 men at work. Next week none of the furnaces will be running. The ore purchases this year will be 1,000,000 tons less than usual.

In 1891 the handling of the raw material required 149,000 cars, and in 1892 158,000 cars, exclusive of the material received by water. Relief can only come by conservative action, uncertainty being the main cause of the present depression.

Taking up the question of labor, Mr. Stirling stated that the percentage of direct and indirect labor in May, 1893, on pig iron was 77 per cent., while material entered into the cost to the extent of 33 per cent. In ingots the direct and indirect labor cost was 79 per cent., while in rails it was 80 per cent. In 1890 the percentage was 67 per cent. During the period from 1886 to 1892 the wages at the Joliet works advanced 12 per cent., while the value of the product declined 11½ per cent.

Mr. Stirling insisted that the cry of free raw material is deceptive. It is impossible to draw a line. To one group the finished product of another is the raw material.

In 1888 Mr. Stirling came before a committee of Congress to urge an adjustment of the duty on wire rods. The promise was made that if adequate protection were granted the American industry would be developed and the home market be supplied. In 1892, under the tariff granted, 94 per cent. of the 670,000 tons of wire rods consumed in the United States was home product. From 1888 to 1892 the Illinois Steel Company produced 211,000 tons of rods, using 985,000 tons of raw material and calling for the payment of \$4,250,000 in wages.

In 1888 the production of spiegeleisen was 50,000 tons. In 1892 it had attained 200,000 tons, of which the Illinois Steel Company produced one-third.

Mr. Stirling urged the committee not to make any change, not to allow so-called raw material to come in free because it would lead to fraudulent importations under the guise of scrap. He insisted that the cost of assembling raw materials is great because the distances are enormous and that the first cost of plant and the high cost of repairs impose high fixed charges upon American manufacturers.

Mr. Stirling stated that before coming to this country he had been an employer of labor for about nine years and since then for 14 years in this country. His experience thus gained has taught him that in wages earned and in possibilities of success the position of the wage earner is beyond compare with what he can do abroad. If the tariff is cut down wages must come down to the European level, and even then manufacturers here cannot compete with foreign producers because they cannot, even under those circumstances, overcome the advantages due to the cost of assembling raw materials, which must of necessity be transported great distances. In an address before the Joliet Business Men's Association Mr. Stirling presented the following figures bearing on this point: At this works it required 4½ tons of raw materials to produce 1 ton of steel rails, which must be hauled on an average 413 miles at a rate \$2.04 per ton for freight, or \$9.58 for freight per ton of rails.

In this respect foreign producers have exceptional advantages. As illustrating how closely English manufacturers figure, Mr. Stirling referred to Cammell & Co., who, in 1879, removed their works bodily from Sheffield to Cumberland, in order to save the haul of the ore from tidewater to the inland city and of the finished product from Sheffield to the sea. He emphasized the statement made by a previous speaker, that American manufacturing corporations have no watered stock, by stating that the capital of the Illinois Steel Company is less by some millions of dollars than the money actually invested in the plants. He avowed himself a consistent protectionist, and urged that ore be not placed

on the free list. In reply to questions from different members of the committee, Mr. Stirling insisted that he did not know of any successful combination which does not in the long run do more harm than good. An effort was made to draw from him some statements relating to the cost of manufacturing steel rails, to which the reply was made that it is altogether impossible to make any general statement, and that on the whole he considered prices a better guide than an estimate of cost. As illustrating how special conditions may affect cost, he stated that five years ago the Illinois Steel Company had at Joliet the best billet mill in the country and yet had, in one of the years during which it was in operation, only realized a profit of \$13,000 on an investment of \$5,000,000. This year \$375,000 have been spent to put the works again into the race with other billet mills. When, if ever, the company will recoup themselves and how this additional outlay is to be made an item of future cost, are questions which only the future can decide. In reply to questions, he stated that ore cost the company, roughly, \$8.75 to \$4.75; coal, from \$1.50 to \$2.25; coke, \$4.25, and limestone, \$1.25. In dealing with the question of whether a lowering of the duty on iron ore would give the works cheaper raw material, Mr. Stirling urged that it would reduce the purchasing power of their own customers. When pressed concerning the Steel Rail Manufacturers' Association, he insisted that it does not in any way attempt to regulate production or to fix prices. He declined, however, to go into details concerning the organization of the association. To show how wages have increased in recent years, Mr. Stirling quoted the average daily wages paid to tonnage men in the Joliet rod mill. In 1888 the average was \$4.67; in 1889, \$6.26; in 1890, \$6.97; in 1891, \$7.78, and in 1892, \$8.18.

John Lambert, vice-president of the Consolidated Steel & Wire Company, made an address, the object of which was to show that the amount of duty does not increase, but actually decreases the price to the consumer. He stated that in 1888 no wire rods were made, but that they were all imported, the price, delivered at New York, fluctuating between \$62 and \$65, while it was \$68 at Joliet. After the duty of 0.6 cent per pound was placed on wire rods, a number of mills were built and the price steadily declined until to-day a better wire rod of American manufacture can be purchased at \$30. In 1888 barb wire was selling at 8 to 10 cents per pound; now it is offered at 2 25 cents. Wire nails have declined in the same period from \$10 a keg to \$1.90. The questions by the committee raised a point whether the cheapening in the price to the consumer was not principally due to improvements in machinery. Mr. Lambert insisted that American inventors would not have had the opportunity to develop wire nail making machinery unless a protective tariff had started the industry. He stated that at his works at Joliet there are employed 1100 men where 75 had been working ten years ago, so that in spite of increased efficiency of machinery the number of persons dependent upon the industry had very largely grown. Some effort was made to draw from Mr. Lambert data relating to the export trade, which amounts to about 6000 to 7000 tons, principally of barb wire—an insignificant amount when compared with the domestic demand, which calls for 300,000 tons. Some of the markets are ac-

cessible to American makers because a combination exists abroad.

Colonel A. M. Shook of Nashville, Tenn., urged the committee to postpone tariff legislation for the present, in view of the depressed condition of the iron industry in the South. Mr. Shook gave a number of data showing how many of the plants in the Southern districts are now idle, and made a particularly strong point of the effect upon the railroads of the great depression in the iron trade. Thus, the Louisville & Nashville Railroad has spent since 1880 \$20,000,000 to build up and develop the iron and coal resources of Tennessee and Alabama—an investment which is practically unproductive at the present time.

Thomas Seddon of the Sloes Iron & Steel Company also appealed to the committee to postpone any action on the tariff for the present, and was particularly urgent in his recommendation that the present tariff on ore be retained. When questioned as to the cost of manufacturing pig iron in the Birmingham district, he answered that roughly \$9 a ton would cover it on an average for the whole district, and stated, in reply to the assertion that pig iron is made more cheaply in Birmingham than in England, that that was an assertion which some Southern iron makers were in the habit of bringing forward when they were bragging.

G. M. Laughlin of Jones & Laughlins, Limited, Pittsburgh, insisted that the present depression in the iron trade is largely accounted for by the uncertainty as to future tariff legislation. He drew a gloomy picture of the condition of the iron industry in the Pittsburgh district and stated that of their 3500 employees about 60 per cent. were given partial employment. He explained that the newspaper reports of the great improvement in the iron industry of Pittsburgh were exaggerated and erroneous. Whenever a single train in a large mill is stopped or started the newspapers represented it as a resumption or suspension of the entire plant. He insisted that there is not a single mill running full time in Pittsburgh to-day and that the average work is probably not up to three days in the week. So far as their own works are concerned, it would have been better for them to close down entirely than to make an effort, for the sake of keeping their men partly employed, to secure orders and run spasmodically. Mr. Laughlin stated that he had observed a gradual decline in business since the beginning of the year and that it had been growing worse and worse. An effort was made by the committee to show by quotations from Mr. Swank's annual reports that they did not agree with Mr. Laughlin's statement that during the last two years demand and supply have been more closely balanced than during his whole experience of 30 years in the iron trade. The poor business alluded to by Mr. Swank in his reports, he explained, was probably dealing with prices rather than with the volume of business transacted.

Cyrus Elder of the Cambria Iron Company, Johnstown, was the last iron-master to be heard, and wound up the protracted hearing with a scholarly and brilliant statement of the position of the producers. He informed the committee that when fully employed the Cambria Iron Company have on their rolls about 7000 men, having last year 7616 employees at the Johnstown works, at their iron mines, limestone quarries, coke ovens and three mining villages in Michigan. The company used in their

blast furnaces last year 883,864 tons of material, produced 257,384 tons of pig iron, 806,356 tons of Bessemer steel, 30,546 tons of open-hearth steel, and made 361,461 tons of coke. The total tonnage of the finished products shipped in that year was 287,442, of which the rail production was 111,601 tons. Of their whole number of employees only 1600 are still at work on full time. He described the serious industrial situation and asserted that the present condition of affairs in manufacturing would have come about even if there had not been a financial panic. Mr. Elder then quoted the figures presented by him before a former committee dealing with the tonnage of freight given by their single establishment in 1887 to the railroads. At that time the haul of limestone, iron ore, coke and other raw materials represented a tonnage of 117,164,977 tons moved one mile, while the average haul of their finished product represented a mile tonnage of 109,200,000. According to Poor's statistics, this was equal to the whole tonnage of Vermont, was in excess of that of Connecticut, largely in excess of that of Maine and South Carolina, nearly equal to that of Colorado, three times that of North Carolina, Arkansas or Oregon, and six times that of Florida and West Virginia. Mr. Elder dwelt also on the cost of assembling materials, and then called attention to the peculiar significance of the fact that the construction of railroads during the history of the United States was made in times of dear rails and not during periods when rails were cheap. He submitted a diagram comparing Atkinson's freight rates with the prices of iron and steel rails and the annual development of railroad building to show the contrast between them.

The time occupied by the protracted questioning of the committee was so great that a number of persons who had been present to add their testimony to that of their colleagues did not have an opportunity to be heard. Among them were conspicuous David Reeves of the Phoenix Iron Company, Phenixville, and H. S. Chamberlain of the Roane Iron Company, Chattanooga. Some of the representatives of the tin-plate industry were also present, among them W. C. Cronemeyer and P. H. Laufman of Apollo. This interest will be given a hearing of only an hour on Thursday, September 14, when there will also be present a delegation representing the Amalgamated Association of Iron and Steel Workers.

Pig-Iron Production.

An important error in the returns of one producer of pig iron, and belated reports from others, modify somewhat our statement of capacity at work on September 1, published in the last issue of *The Iron Age*. Among the anthracite furnaces the Thomas Iron Company blew out two furnaces in August. In Kentucky both the Ashland were banked on August 31, Emma in Ohio was put out on the 1st and Trussville was banked on the 25th ult. This reduces the anthracite capacity to 20,758 tons per week, that of the coke furnaces to 56,976 tons per week, while the corrected charcoal capacity is 4868 tons. The total is, therefore, 125 active furnaces with 82,603 tons weekly product instead of 132 furnaces with a capacity of 85,510 tons.

In 22 days just previous to the closing of the Biwabik Mine, on the Mississippi, on account of the money strin-

agency, 30,000 tons of ore was shipped. It was claimed, says the *Cleveland Marine Review*, that with one steam shovel the average number of cars loaded in a full day, including time taken up in switching and moving the steam shovel, was 60 of 24 tons each.

Tests of the Howells Torpedo.

Advices from the Government torpedo station at Newport report very gratifying success in further experiments with the Howells automobile torpedo. A few days ago the torpedo, in an unofficial trial, developed a speed of 26 knots an hour over an 800-yard course. This speed is 4 knots in excess of contract requirements. The official trials have been suspended temporarily pending the completion of some alterations on the torpedo vessel "Stiletto." The severest task to which the torpedo will be put is its discharge from the "Stiletto's" launching tubes while the vessel is under way. It is generally believed that the weapon will successfully meet this test and so satisfy the most rigid requirements. The Howells is the only American automobile torpedo which has made any particular success in the direction of speed, accuracy and general efficiency. Its inventor is Captain Howells of the navy. At an expense of \$104,000 the Government has contracted to purchase 30 of the torpedoes and launching tubes.

Recent Sheet and Tin Plate Statistics.

The Bureau of Statistics has included in its last monthly report a series of statistics relating to imports of sheet iron and steel. No comment or explanation accompanies the tables. We print below the imports of iron and steel sheets for consumption:

Sheets of Iron or Steel, Common or Black, Including Iron or Steel Known as Common or Black Taggers' Iron or Steel, and Skelp Iron or Steel, Valued at 3 Cents Per Pound or Less. (Duty, 1.4 Cents Per Pound.)

[Thinner than No. 25 wire gauge.]

Quarter ending	Pounds.
December 31, 1890.....	1,927,073
March 31, 1891.....	1,014,722
June 30, 1891.....	1,228,158
September 30, 1891.....	1,470,536
December 31, 1891.....	2,700,514
March 31, 1892.....	2,577,279
June 30, 1892.....	1,944,436
September 30, 1892.....	1,820,048
December 31, 1892.....	2,224,328
March 31, 1893.....	2,451,530

Sheets of Iron or Steel, Common or Black, &c., Cold Rolled, Cold Hammered or Polished in any way, in Addition to the Ordinary Process of Hot Rolling or Hammering. (Duty, 1.65 Cents Per Pound.)

[Thinner than No. 25 wire gauge.]

Quarter ending	Pounds.
September 30, 1891.....	282,124
December 31, 1891.....	729,001
March 31, 1892.....	2,504,365
June 30, 1892.....	3,242,230
September 30, 1892.....	7,542,732
December 31, 1892.....	14,130,037
March 31, 1893.....	15,123,276

Sheets and Plates Pickled or Cleaned by Acid, or by any Other Material or Process, and Cold Rolled, Smoothed, not Polished. (Duty, 1.65 Cents Per Pound.)

[Thinner than No. 25 wire gauge.]

Quarter ending	Pounds.
December 31, 1890.....	520,014
March 31, 1891.....	340,312
June 31, 1891.....	590,011
September 30, 1891.....	504,479
December 31, 1891.....	245,240
March 31, 1892.....	1,153,343
June 30, 1892.....	1,183,533
September 30, 1892.....	860,032
December 31, 1892.....	1,638,523
March 31, 1893.....	1,584,066

The following is the official report of Ira Ayer, for the quarter ending March 31:

gether the Falcon Iron & Tin Plate Company of Niles, Ohio, Griffiths & Cadwallader being at Pittsburgh. The

Domestic Manufacture of Tin and Terne Plates.

Quarter ending	Tin plates. Pounds net.	Terne plates. Pounds net.	Total. Pounds net.	American black plate used. Pounds net.	Foreign black plate used. Pounds net.
1891.					
September 30.....	192,438	674,433	826,923	785,547	41,375
December 31.....	215,911	1,193,910	1,409,821	1,200,961	209,160
Six months.....	368,400	1,868,343	2,236,743	1,986,508	250,535
1892.					
March 31.....	1,099,556	2,109,569	3,209,225	2,132,082	1,077,143
June 30.....	3,071,534	5,129,217	8,200,751	5,175,263	3,022,488
Six months.....	4,171,190	7,238,786	11,409,976	7,310,345	4,099,631
Fiscal year.....	4,539,590	9,107,129	13,646,719	9,296,553	4,350,166
September 30.....	3,611,967	7,841,358	10,953,325	5,920,092	5,033,233
December 31.....	6,138,739	18,617,752	24,756,491	8,043,449	11,713,042
Six months.....	9,750,706	20,959,110	30,709,816	13,963,531	16,745,985
1893.					
March 31.....	15,244,574	14,821,835	29,566,399	11,371,968	18,194,431

Under the recent ruling only the figures given in the fourth column would represent American product.

The following tables are printed without explanation:

Pittsburgh Tin Plate Company are a New Kensington, Pa., and not at Niles, Ohio. It is quite evident that there has been some slovenly work in the compilation.

Firms Reporting in the Two Periods.

Name.	Capital.	Estimated yearly production in report April, 1892.	Annual based on three and one-half times actual returns, quarter March 31, 1893.	Plates used.
	Dollars.	Pounds.	Pounds.	
American Tin Plate, Elwood, Ind.....	50,000	4,000,000	7,077,000	American.
American Iron and Tin Plate, Philadelphia.....	25,000	2,500,000	1,020,000	Principally foreign.
Apollo, Apollo, Pa.....	60,000	4,000,000	700,000	American.
Blairstown, Pa.....	75,000	6,000,000	156,000	American.
Cincinnati Corrugated, Cincinnati.....	2,000	750,000	514,000	American.
Cleveland Tin Plate Company, Cleveland.....	15,000	3,500,000	899,000	Three-fourths American.
Columbia Tin Plate, Piqua, Ohio.....	4,000	1,500,000	700,000	One-sixth American.
Griffiths & Cadwal, Niles, Ohio.....	2,000	750,000	736,000	Three-fifths American.
John Hamilton, Pittsburgh.....	4,000	1,500,000	1,875,000	Seven-eighths American.
Coates & Co., Baltimore.....	150,000	7,000,000	2,771,000	American.
Marshall Bros., Philadelphia.....	100,000	4,800,000	1,670,000	American.
Matthal, Ingram & Co., Baltimore.....	2,000	750,000	661,000	Foreign.
McKinley, Wilkesburg.....	4,000	1,500,000	396,000	Three-fourths American.
Merchant & Co., Philadelphia.....	2,000	750,000	8,445,000	Foreign.
N. & G. Taylor.....	400,000	34,000,000	18,500,000	Foreign.
Norton Bros., Maywood, Ill.....	400,000	36,000,000	2,991,000	Foreign.
P. H. Laufman, Apollo, Pa.....	50,000	3,000,000	665,000	American.
Pittsburgh Tin Plate, Newark, Pa.....	60,000	7,000,000	1,566,000	Foreign.
Record, Conneaut, Ohio.....	50,000	4,700,000	1,751,000	One-fourth American.
Scott, J. B., Pittsburgh.....	4,000	1,500,000	908,000	American.
Somerton, Brooklyn.....	250,000	14,000,000	1,436,000	American.
St. Louis Stamping Company.....	400,000	28,000,000	7,590,000	American.
United States Iron & Tin Plate Company.....	450,000	10,000,000	5,080,000	American.
Wallace Banfield, Irondequoit.....	120,000	10,000,000	4,800,000	American.
Total.....	\$2,969,600	182,000,000	67,480,000	

There are a number of mistakes in this table, which we print as it stands in the original document. The Cincinnati Corrugating Company are located at Piqua, Ohio, and not at Cincinnati. Something is wrong with the line "Griffiths & Cadwal." It seems probable that there is omitted here alto-

Firms Reporting in April, 1893, but not Reporting in April, 1892.

Name.	Capital. Dollars.	Estimated yearly production. Pounds.
Anderson.....	25,000	4,000,000
Britton.....	1,200,000	10,000,000
Corning.....	80,000	5,000,000
Cumberland.....	50,000	4,000,000

Krystone.....	4,000	1,500,000
Lewiston.....	120,000	11,000,000
Newcastle.....	160,000	12,000,000
Total.....	1,524,000	47,500,000

New Firms Reporting in March, 1893.

Name.	Annual production.*	Plate used.
Thompson.....	1,832,000	Foreign.
American Stamp.....	5,845,000	Foreign.
Baltimore.....	4,188,000	Foreign.
Gummeys.....	1,532,000	Foreign.
Morewood.....	10,881,000	Foreign.
Norristown.....	5,874,000	Foreign.
Philips.....	1,108,000	Foreign.
Saunders.....	1,884,000	Foreign.
Total.....	33,061,000	

*Estimated at three and one-half times last quarter's production.

The first table evidently represents the expectations of producers early in 1893 and the realization thereof a year later. It is quite clear that an estimate based upon three and a half times the product of the last quarterly return is eminently safe from the standpoint of the compiler, but the fact is ignored that some of the mills only began work during the period which forms the basis of the compilation, and that the latter is, therefore, very inadequate and looks unfair.

MANUFACTURING.

Iron and Steel.

The entire plant of the Falcon Iron & Nail Company, at Niles, Ohio, was put in operation on full time last week. As to whether the plant will continue running in this manner depends altogether upon the receipt of orders.

The Brown, Bonnell Iron Company, Youngstown, Ohio, have announced a reduction of wages amounting to 10 per cent, which applies to all employees except those working under the Amalgamated Association scale. The reduction took effect September 1.

The tube works and socket departments of the Reading Iron Company, at Reading, Pa., closed down last week owing to the dullness in trade.

Last week copies of the following notice were posted at the Duquesne Steel Works, Duquesne, Pa.: "A reduction of wages of 10 per cent. is ordered in all departments connected with this works, except where employees are paid 13 cents per hour, in which case a reduction of 1 cent per hour will be made, and except also in case of men paid salaries who have recently had a reduction. The reduction will go in effect Monday, September 11, on which day all departments in this works will be put in operation at 6 a.m."

The Carbon Iron & Steel Company, Limited, Ferryville, Pa., have razed their No. 1 furnace to the ground. The furnace was built in 1855 and was blown by water power. Additions were made to hot blast in 1857, and in 1859 an engine was added, increasing the output from about 100 tons per week to an average of 200 tons per week. The same company are making extensive repairs at their No. 3 furnace, including the building of three Whitwell-Cowper stoves, using the Foote brick. They expect to have the furnace in blast within the next three months, and in addition to maintaining the reputation of their Viking iron, will give the steel trade a high grade of low phosphorus, low silicon and low sulphur iron.

The Phoenix Horseshoe Company, who have for some time been building a large plant at Joliet, Ill., are now nearing the consummation of their work. Last week they started up several puddling furnaces, and will from this time gradually get the different departments in operation. The company will roll iron into bars, and thus manufacture all the stock needed for their horseshoe machines. Within a month it is expected that 350 men will be employed in the new works.

In a recent issue of *The Iron Age* we stated that the Steel & Iron Improvement Company, Pittsburgh, Pa., would erect an open-hearth steel plant at Ashtabula, Ohio, under the name of the Ashtabula Steel Company, in which it is proposed to use

the Adams-Blair direct process. We now have advice from the concern giving us details and sizes of a number of their buildings, contracts for some of which have already been let. It is proposed to erect two main buildings, each 230 feet wide by 380 feet long, with leanto on each 50 feet wide, the contract for one of the buildings having been closed. There will be two other buildings 60 feet wide by 416 long, each with a leanto of 20 feet wide, for one of which a contract has been closed. There will also be four boiler houses, each 30 feet wide and 100 feet long, contract for two having been closed. All of the buildings will be of iron, and it is proposed to erect them in a very substantial manner. The foundry and machine shop will be located in one building, built of brick, and will be 108 feet wide and 160 feet long. In addition to the above, contracts have been closed for boilers and engines, while it is expected that additional contracts for cranes and other machinery will be awarded in a few days. We are also advised by the above named concern that they will erect 20 20-ton open-hearth furnaces instead of two 20-ton open-hearth furnaces, as was stated in our issue of last week.

The Tipton Furnace Company, at Tipton, Pa., have posted notices announcing a reduction in wages of from 10 to 25 cents per day, taking effect on September 1.

Additional departments of the Homestead Steel Works, Homestead, Pa., have been started up, and with few exceptions the plant is running single turn in all departments.

The P. Hayden Saddlery Hardware Company, operating the Columbus Iron Works, Columbus, Ohio, signed the Amalgamated Association scale last week, and operations have been resumed, though not to full capacity.

Very little work of any kind is being done at the Edgar Thomson Steel Works, Bessemer, Pa. About half the clerks have been discharged, and this plant is quieter now than for many years past. Work on the new foundry, which is almost completed, was entirely suspended some time ago.

The rolling mill of John A. Roebling's Sons Company, at Trenton, N. J., resumed operations on the 11th inst., after a shut down of three weeks. The remainder of the works are still on half time.

The axle department of the Pittsburgh Steel Works of Anderson, Dupuy & Co., at Chartiers, Pittsburgh, was started up last week. All departments of this plant are now in operation on single turn.

At the plant of the Hainsworth Steel Company, at Pittsburgh, Pa., which was started up with non-union men on Monday morning, September 4, all departments are now running single turn. Should orders justify it is probable that the plant will be put on double turn within a short time. So far no trouble whatever has been experienced by the firm in procuring competent workmen, there being two or three applicants for every position the firm had vacant.

The furnace employees of the Stewart Iron Company of Sharon, Pa., have agreed to a reduction in wages and the furnace will continue in blast.

A number of employees in the bridge works of the Pottsville Iron & Steel Company, Pottsville, Pa., have been suspended on account of a falling off in orders. The question of starting up the puddle mill on double turn is still unsettled.

The Aliquippa Steel Company, Westinghouse Building, Pittsburgh, Pa., with mills at Aliquippa, Pa., advise us that their works have not yet been started up, but necessary repairing will be done during this week, and it is hoped to start up all departments of the plant on Monday, the 18th inst. How long operations will be continued depends altogether upon receipt of orders.

Excellent progress is being made by the Oliver Iron & Steel Company of Pittsburgh, who started up their South Tenth Street Mills in that city with non-union men, as reported in our issue of last week. Up to Friday, the 8th inst., the 16-inch, 12-inch and 8-inch bar mills were in operation on single turn, and while the output was not quite so large as formerly, it is fully up to the quality secured when the works were running with Amalgamated Association labor. This firm have made an arrangement with their chief roller by which he receives a salary, and owing to the very large number of idle men, they have found little difficulty in procuring workmen as

fast as they could be utilized. Had the condition of trade warranted, there is no doubt whatever but that this firm could have started up every department of the above plant within a few days after announcement was made that the Amalgamated Association would no longer be recognized, nor any wage scale of any kind be signed. Should trade continue to improve, this plant will be put on double turn in some departments, and in a very short time the Lower Mills of the firm, situated in Allegheny, Pa., will be put in operation. As far as this firm is concerned, they have achieved a signal victory over the Amalgamated Association and with comparatively little trouble. All told, not more than four or five firms in Pittsburgh now recognize the above organization.

The Pittsburgh Forge & Iron Company of Pittsburgh, whose works in Allegheny, Pa., have been idle since the expiration of the Amalgamated Association scale on June 30, have announced a reduction of 10 per cent. in the wages of employees, which includes everybody from the president down to the lowest paid laborer. However, it does not affect workmen who have heretofore been working under scale rates. As yet there are no immediate prospects of the plant of this firm resuming operations.

Additional departments of the plant of the National Tube Works Company, McKeesport, Pa., continue to be put in operation right along. Should the improved demand for pipes and tubes, noticeable for some time past, continue, it is likely that the above works will soon be operated to nearly full capacity.

During the week ending September 9 all of the works owned by the Falcon Iron & Nail Company, Niles, Ohio, were in operation. They comprise seven light sheet mills, two tin mills and one skelp mill, together with sufficient puddling, scrapping and bar rolling capacity to furnish material for the mills mentioned. The galvanizing shop, containing two pots, was also in operation. Fully 750 men were employed. There is no certainty in regard to a continuance.

Last week a conference was held at Youngstown, Ohio, between the Union Iron & Steel Company of that city and their employees, at which the firm made a proposition to the effect that work would be resumed providing the finishers agreed to accept a reduction of 10 per cent. The following official statement has been given concerning the proceedings of the meeting: "The Union Iron & Steel Company met the men employed in the finishing departments of their four mills here and at Girard and Warren. They discussed the situation. The company stated the delay in starting their mills was not due solely to the difficulty in getting money for pay rolls, but rather to the present stagnant condition of trade, which has brought lower prices and consequently necessitates a reduction of cost at every possible point, and of this reduction the men should stand their share. The company also explained to the men that at present it would be impossible to get enough work to run the mills on full turns at any price, and that the outlook was not bright. But they proposed to sign the scale at once if the men would make a reduction of 10 per cent. from the scale of prices of last year for the finishing mills; and they would get what work they could on this basis and start such of their mills as they could find work for as fast as the work could be secured." At a subsequent meeting of the employees it was decided not to accept the proposition made by the firm.

The inventory and schedule of the Troy, N. Y., Steel & Iron Company, for which a receiver was recently appointed, has been filed. The list of creditors shows that there is \$1,450,821.82 owing by the company. The assets exceed that amount, though it is impossible to tell what might be realized by the sale of the plant. The valuation of the merchandise includes 27,725 tons of pig iron, \$374,293.57; 5171 tons of billets and blooms, \$116,362.12; 1,703,412 pounds of merchant steel, \$29,806.71, and 1,376,048 pounds of Troy iron, \$28,140.72. These are the largest items. The accounts receivable include the Q & C Company, Chicago, Ill., \$26,216.02; Isaac G. Johnson & Co., Snyten Duvyil, \$3,725.79; U. S. Projectile Company, Brooklyn, \$13,513.35, and a large number of smaller ones. The doubtful accounts foot up \$28,574.06. The inventory states there is no incumbrance save judgments for injuries amounting to \$2,630.28, which have been appealed, and 20,000 tons of pig iron mortgaged. There are 21 unsatisfied engagements which have been en-

tered into. Of the notes held by the company it is believed that all but \$26,838.82 can be regarded good. Among the creditors of the company are included the following: Certain banks, \$210,000; Chas. Pratt & Co., New York, \$90,000; Benjamin Brewster, New York, \$100,000; George W. Swett, Troy, \$14,725.30, notes for castings; H. H. Rogers, New York, \$60,000; Standard Oil Company, New York, \$200,000, notes; Fall Brook Coal Company, about \$74,000; Wm. Kemp, Troy, \$71,300, notes for money loaned; Alice J. Rogers, Troy, \$2500, notes for money loaned; E. J. Connolly, Troy, \$4000, notes for money loaned; Emily D. F. Burbeck, Troy, \$5000, notes for money loaned; J. M. Warren, Troy, \$10,000, notes for money loaned; William Rockefeller, \$75,000; J. D. Rockefeller, \$250,000; H. M. Flagler, \$95,000.

The Cherry Valley Iron Works of Leetonia, Ohio, made a proposition to their employees to accept notes at 90 days in part payment for wages in case the company felt disposed to issue same. At a meeting of the employees it was agreed to accept the notes for 75 per cent. of their wages in case it became necessary for the company to issue such scrip. The notes which the company may issue will be in amounts of \$5 each, for value received, payable three months after date, in current funds, with interest at the rate of 7 per cent. per annum, and bills receivable will be deposited with the First National Bank of Leetonia as security for the payment of the notes. The company may not, however, avail themselves of the privilege provided financial matters improve and they are able to secure accommodations at bank.

The continued depression in business and the decline in prices have compelled the management of the Reading Iron Company, Reading, Pa., to announce a reduction in wages in the rolling mill department, Scott foundry, steam forge and sheet mill of 5 per cent. The minimum basis of \$1 for ordinary common labor will not be changed.

The Latrobe Steel Works, at Latrobe, Pa., have closed down for an indefinite period, owing to dull trade, and 300 men are out of employment.

The American Wire Nail Company of Cleveland, Ohio, have resumed work in the continuous mill. Over 1500 men applied for work, but only 100 were engaged, as this number constitutes a full force in this department.

After an idleness of six weeks the Hercules Iron Works of Aurora, Ill., have started up with a small number of hands, and operations will be resumed in full as soon as the new organization can be effected.

On September 1 the firm of Hopkins & Schley of Savannah, Ga., brokers and manufacturers' agents, were dissolved by mutual consent. The business will be carried on in the future by E. M. Hopkins.

The Pencoyd Iron Works, Pencoyd, Philadelphia, announce a reduction in wages of 10 per cent., beginning September 18. The puddlers will be cut down to \$3.25 per ton.

The Susquehanna Iron Company and the Columbia Iron Company, both of Columbia, Pa., have resumed operations, giving employment to 900 men and boys. The puddlers' wages at both rolling mills have been reduced to \$3.35 per ton, and all other salaries have been cut down 10 per cent.

H. A. Jones, who claims to be the inventor of improved methods and appliances for the manufacture of steel, has made a proposition to the city of San José, Cal., to erect a steel plant at that place.

The American Wire Nail Company of Anderson, Ind., employing about 600 men, have posted notice that hereafter the company will operate all their mills non union, work to be resumed as early as possible between date of notice and October 1. Employees who do not apply for work before September 20 will be stricken from the rolls.

The sheet mill of Summers Bros. & Co., Struthers, Ohio, has been in operation for several weeks.

During last week the Union Iron & Steel Company, Youngstown, Ohio, invited rollers and finishers from their various mills to a conference, at which the deplorable condition of trade was fully explained and a proposition made to commence operations with what little business there is in sight, provided the men would accept a reduction of 10 per cent. from last year's scale of wages. After adjournment a meeting was held by the men and the proposition rejected. There is now no prospect of a resumption of operations at present. The mills affected are the Upper and Lower

Youngstown mills, also those at Warren, Girard and Pomeroy, all in Ohio.

The Cumberland Steel & Tin Plate Company, Cumberland, Md., are now running their mill to its full capacity after a shut down of ten days for necessary repairs.

The Newport Rolling Mill, Newport, Ky., has resumed in all departments, giving employment to over 500 men.

The Falcon Iron & Nail Company of Niles, Ohio, have started their works with a force of 800 men.

The sale of the West Superior Iron & Steel Company's plant, at West Superior, Wis., has been postponed until September 15.

Machinery.

A meeting of the stockholders of the Pittsburgh Mfg. Company, Pittsburgh, Pa., was held in that city last week, at which the old officers and directors were re-elected. This concern manufacture Crosgrove's straightening, bending and punching machines, bolts, rivets, castings, &c., and have enjoyed a very satisfactory trade during the past year.

At Pittsburgh last week Samuel McCrum was appointed receiver of the Nation's Mower & Reaper Company, with works at Latrobe, Pa., in place of Robert McAfee, who declined to serve.

The Allen Foundry Company of Detroit, Mich., have sold their entire plant to the Ideal Mfg. Company, adjoining property owners, who will continue the plant in operation in connection with their own business.

Buck's Stove & Range Company of St. Louis, Mo., are making preparations to resume at once with a full force of 350 men. The company closed their foundry July 29 on account of the prevailing depression in general trade, but within the past few days the conditions brightened so that they deemed it advisable to resume operations with all possible haste.

The annual meeting of the stockholders of the Westinghouse Air Brake Company was held at Wilmerding, Pa., last week, at which the old officers were re-elected. The report of operations for the year submitted to the stockholders showed that the net profits for the year amounted to nearly \$2,100,000. It is stated that sufficient orders have recently been booked to insure operations on a limited scale for some time to come.

Forty molders in the Farrel Foundry & Machine Works, at Ansonia, Conn., have struck against a reduction in wages. The molders in the Birmingham Iron Foundry, at Ansonia, have also gone out for the same reason.

The burning of the boiler works and pattern shop of the Gray's Ferry Foundry & Boiler Company, Philadelphia, will not entail as large a loss as was at first reported. The loss will not be over \$25,000 and the works will not be shut down or contracts interfered with. The work of rebuilding will be begun at once.

Eight hundred machinists in the employ of R. Hoe & Co., the printing press manufacturers, of New York, went on strike against a reduction of 10 per cent. in wages.

Work on the new factory of the Franklin Brass & Bronze Company, at Birmingham, Conn., is progressing rapidly, the foundry building being nearly completed.

The Watertown Iron Foundry, Watertown, Mass., which has been shut down over two months, has started up with a force of 100 men.

All the factories of the Peck, Stow & Wilcox Company, at Plantsville, East Berlin, and Southington, Conn., have started up on full time. For a month they have run on half time and last week shut down entirely.

Messrs. Fackler and McMullin of the Fort Dodge Foundry Company, have purchased a site at Fort Dodge, Iowa, and will erect a new foundry building.

The Novelty Iron Works, at Oskaloosa, Iowa, have been damaged by fire to the amount of \$5000. Most of the heavy machinery was saved, but the patterns are a total loss.

The Variety Mfg. Company of Chicago Heights, Ill., are manufacturing a sheet-iron exhaust head for engines, which is claimed to effect important economy in the use of steam. This is supported by the steady increase in orders for the exhaust head, showing that it meets with the approval of those who have used it. Further,

the device is placed on the market at a popular price.

On the 8th inst. the Hurlbut Mfg. Company of Racine, Wis., made an assignment to John Armstrong. The assets are given at \$60,000, and liabilities at a few thousand less. The cause of the failure is the company's losing \$20,000 in the Ironclad Dray Company of Chicago, who went to the wall a short time ago. The Hurlbut Company are manufacturers of general machinery, plumbers' goods, and also operate a jobbing foundry.

The Eastern Forge Company of Portland, Maine, have made a reduction in wages of from 25 to 50 cents per day, which the men will probably accept.

The Star Machine Company of Buffalo, N. Y., manufacturers of forges and blacksmiths' hand blowers, have gone into the hands of receivers. The total schedule of indebtedness is \$15,411, while the nominal assets are placed at \$59,781. The latter, it is stated in the petition, are of a character not easily convertible into cash.

For the first time in the history of the company the Chelmsford (Mass.) Foundry Company are compelled by the stringency of the times to temporarily shut down a portion of their works at North Chelmsford.

At a meeting of the stockholders of the Springfield Boiler & Mfg. Company of Springfield, Ill., it was decided to increase the capital stock from \$18,000 to \$78,000.

We are advised that the report of the closing of the foundry of the Franklin Machine Company, at Providence, R. I., is incorrect. The foundry is in operation, and all orders for castings will be filled promptly in the future as in the past.

The Portland Foundry & Machine Works of Portland, Maine, have purchased the foundry stock of the Dirigo Heater Company of the same place.

The stove foundry of Baldwin & Graham, at New Castle, Pa., has started up after an idleness of several weeks. About 200 hands are employed.

The Morse Twist Drill & Machine Company of New Bedford, Mass., in addition to reducing their working time to four days per week, have discharged a number of machinists.

The Pratt & Whitney Company of Hartford, Conn., are enjoying a prosperous business, employing 1100 hands and running full time.

The molders at P. H. & F. M. Root's foundry, at Connersville, Ind., have struck, because of a 20 per cent. reduction in wages.

The Whitely Malleable Iron Works of Springfield, Ohio, have started up with a force of 200 hands.

The molders employed by the Putnam Machine Company of Fitchburg, Mass., have stopped work because of a cut down of their wages from \$2.25 to \$1.80.

Parker, Field & Mitchell, engineers and machinists, of Cambridge Mass., will begin early this fall the erection of new and extensive shops.

At the works of the Washburn & Moen Mfg. Company, Worcester, Mass., an improved trade is being realized. The works are at present running five days a week and will shortly start on full time.

The Brown & Sharpe Mfg. Company of Worcester, Mass., have resumed operations at their works after a shut down of four weeks. They are now working full time, but only 400 men, or about two-thirds of the usual force, have been given employment.

The creditors of the J. H. McLain Machine Works at Canton, Ohio, have effected an adjustment of the affairs of the company and it is probable that the works will be put in operation at an early date.

The Malleable Iron Works, at Toledo, Ohio, who employ about 700 men when running full, have resumed with 200 men.

The Watertown Iron Foundry, Watertown, Mass., which has been shut down for two months, has started up with a force of 100 men.

The Pennsylvania Machine Company of Philadelphia shipped by the last trip of the steamer "Switzerland" of the American Line, to Paris, France, three of their improved American wood-working machines. These are for use in the carshops of the Compagnie Générale de Construction, St. Denis.

We are advised that the contract for the Ashtabula Steel Company's engines and boilers has been closed by J. A. Rose of

Salisbury, Pa., for A. B. Farquhar Company, York, Pa., for 20 125 horse-power each return tubular boilers, and two automatic 1000 horse-power each Von Mengerhausen engines.

Miscellaneous.

The D. C. Miller coal tract, situated in Mount Pleasant Township, Westmoreland County, Pa., has been purchased by the H. C. Frick Coke Company. It is stated that the farm contains 116 acres of good coking coal. The price paid is given at \$64,000, or about \$555 per acre.

The Star Fire Brick Works of Harbison & Walker, at Pittsburgh, were closed down for two weeks, but not on account of lack of orders, as the concern state they have several large contracts. Their customers were in no immediate need of material, and as this firm believed the currency famine would be of short duration, their works were closed down for a short time in preference to paying their men with checks or certificates. Their entire plant was started up to full capacity on Monday, September 4, and it is expected to run right along. This firm have an annual capacity of 20,000,000 fire brick.

The Knowles Steam Pump Works, at Warren, Mass., have started up with only 40 bonds and a cut of 10 per cent. in wages. Additional help will be taken on as fast as the business warrants.

The strike of machinists and shopmen on the Louisville & Nashville Railroad, including some 900 men, in all the shops of the system, is still on. A strike of the trainmen on the same system has been averted by a compromise, by which the men will accept a 10 per cent. reduction, and the company agree to restore wages December 1, provided the business of the company will warrant. The question will be settled by a board of arbitration. It is believed that this agreement will adversely affect the cause of the machinists' strike and lead to a settlement on the same basis.

The American Projectile Company of Lynn, Mass., are operating their factory 22 hours per day, and, with the present capacity of the works, it will require five years in which to complete the Government contracts now on hand for army and navy ordnance. In addition to this work the company have recently furnished estimates to the Argentine Republic in a contract involving 500 tons of projectiles of different calibers.

The works of the United States Cartridge Company at Lowell, Mass., are shortly to resume operations.

About 40 employees of the American Brass Works at Cincinnati, Ohio, went on strike on account of a cut of 10 per cent. in wages.

Assignee H. J. Baker of the Terre Haute Car & Mfg. Company, Terre Haute, Ind., has filed a petition in the Circuit Court for an order to permit the company to rebuild a portion of the burned plant. Judge Taylor granted the petition.

The Meyer United States Standard Scale Company of Newark, N. J., have received an order from the Government to supply all the United States Custom Houses and Internal Revenue offices with scales for two years, and to keep the scales in order. The contract is worth from \$75,000 to \$100,000 a year.

The Ahrens & Ott Mfg. Company of Louisville, Ky., manufacturers of plumbers' supplies, have re-opened their brass and iron foundries, the former with a full force of men and the latter with half the usual force.

The Union Metallic Cartridge Company of Bridgeport, Conn., who have been shut down for some time past, have announced that operations will be resumed at their works with a full force on full time.

The Moline Plow Company of Moline, Ill., have started up their works. A reduction of 10 per cent. was made in wages, affecting those receiving more than \$1.50 per day.

The 125 employees of the Smith & Wesson revolver works, at Springfield, Mass., have been notified that those receiving over \$1.50 per day will be subject to a reduction of 10 per cent. in wages, beginning October 1.

The Sercombe-Boite Mfg. Company, manufacturers of bicycles exclusively, at Milwaukee, Wis., have gone into receivers' hands on the application of two of the stockholders. The company do a large business. No statement has yet been made.

TRADE REPORT

Extraordinary efforts appear to be made by a number of steel works and rolling mills to secure work enough to start, or to get enough to keep running even at a slow rate. Naturally, distant markets are sought, and it appears that Western Pennsylvania is the principal aggressor, while the natural territory of the Eastern Pennsylvania mills is the favorite battle ground. These raids have a very unsettling effect upon values, which are really now only being established after what has amounted to practically two months' suspension of business. While, therefore, the announcements of the partial resumption of work at the mills may be regarded as encouraging so far as the volume of business is concerned, they imply woeful sacrifices so far as prices are concerned. Of course it was well understood that improvement could only develop after the tonnage of orders had reached a comfortable total for the mills, but few believed that the start could possibly be made from a lower range of values than that previously attained.

Pittsburgh openly quotes \$19.50 for Billets, and even intimates that slightly lower prices would be accepted as a starter; and now comes the report that the Amalgamated Association has sent out circulars to its lodges to ask authority to propose to the manufacturers a reduction of 10% in the finishing departments. Practically, if accepted by the manufacturers, this would mean an increased pressure from the Western mills, with their cheap crude material.

From Western markets, notably from Chicago and Cincinnati, come reports of very good sales of Southern Iron, but at very low prices. There is good evidence that even the low level of \$7 at Birmingham for Gray Forge has been cut under special circumstances. In New York a 5000-ton block of warrant Iron is being pressed for sale by bankers, and there is soon to be the spectacle of an auction sale of Charcoal Iron. Some of the wreckage is evidently being cleared away, since the chance has come to dispose of stuff at any price.

There is more inquiry for Wire Rods, since the Wire mills are again starting, and business is going in the West at \$27.25 @ \$27.50. Orders for Bars are coming out in Chicago, and more business is being done in Structural Material in the leading centers of consumption. All this is satisfactory so far as it goes, but it will take very much more progress in this direction before prices get back to a figure which bears a modest balance on the right side of the ledger. Weak producers have no business in the arena until the hungry giants have withdrawn.

In the metal trade progress toward better prices has continued.

Chicago.

(By Telegraph.)

Office of The Iron Age, 52 Dearborn street, CHICAGO, September 13, 1898.

The general response to questions about business now is that trade is picking up. This is met on all sides and in almost every branch. The feeling has changed remarkably from one of anxiety and distress to hopefulness, and in some cases almost to buoyancy. There is a tendency to exaggerate the improvement in trade, which may lead to disappointment if the recovery is not so rapid as was expected; but unquestionably the corner has been turned, and from this time reports of better business may be expected. The railway companies are enjoying considerably better patronage, the movement of freight last week having been fully 20% greater than the week before. So much depends on the condition of the railroads here that this is a fact of sufficient importance to mention. The railroads have been so economical in their purchases of material that the improvement in their business is gratifying to a very large circle of manufacturers and merchants. Another pleasant feature which is frequently mentioned is that people are now beginning to pay up their past due obligations. Exchange is also down to its normal condition, and commerce can pursue its way without encountering such unpleasant obstacles.

Pig Iron.—Considerably more inquiry is reported for Coke Iron. The largest dealers state that the inquiry is better than for any time during the past two months, and in some cases comes from unusual quarters, indicating that consumers are not able to get the Iron they have been in the habit of taking. Thus far actual business has developed to only slight extent from this increased inquiry, although apparently reliable reports are out that two or three heavy transactions have been entirely closed in Southern Coke. One of these was for Gray Forge and the others for Foundry Iron, all for deliveries running over 12 months, and of course all at very low prices. Shipments on contracts are heavier than they were and foundrymen report a better outlook among their customers. The feeling is decidedly better in every direction, but the impression is general that the return of activity will be gradual rather than rapid. Lake Superior Charcoal is still very dull. Prices continue as last quoted, subject, as before, to concessions for prompt cash or on large quantities.

Bars—The inquiry in this line is good and prospective business is much heavier. Negotiations are pending for considerable quantities for use in directions in which the consumption has latterly been very light. While the inquiry is better, prices appear to be weaker. Manufacturers are competing briskly for any business now in sight. The mills that have started up are evidently anxious to continue running and are straining every nerve to capture more orders. The price of the Bar Iron, mill shipment, Chicago delivery, is now generally 1.45¢, while anything like a desirable specification can be placed at lower figures. Soft Steel Bars have gone at rates lower than ever on season contracts, but on small shipments for early delivery prices are well maintained and are still quoted at 1.60¢ @ 1.65¢, Chicago. Jobbers report a very much better demand from local con-

sumers and numerous inquiries from the country. The small manufacturing consumers are again resuming work and this throws a better business into the hands of jobbers. Small lots from stock are quoted at 1.65¢ @ 1.85¢ for Bar Iron and 1.70¢ @ 1.80¢ for Soft Steel Bars, with some shading on the Iron prices.

Merchant Steel.—Little has been done since our last report, but season contracts are still pending and some are likely to be closed within a short time. Specifications are now being received on some of the contracts placed, showing that consumers are getting to work. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel, 1.90¢ @ 2¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Rails and Track Supplies.—The Steel Rail trade continues as dull as previously reported. Very little is doing in Fastenings. Prices are maintained at \$30 @ \$32 for Steel Rails, 1.60¢ @ 1.65¢ for Splice Bars, 2.55¢ @ 2.60¢ for Track Bolts with Hexagon Nuts and 1.85¢ @ 1.90¢ for Spikes.

Structural Material.—The improving financial conditions at Milwaukee promise considerable work there in the early future, both in new buildings and bridges. Inquiries are being received here based on this fact. The Carnegie Steel Company have secured the new Champlain building in this city. A large structural house here states that it has done more business within the past week than in any previous period for many months. The demand for small lots continues excellent, and a great deal of material will still be purchased before the winter closes in. Mill shipments, Chicago delivery, are quoted as follows: Beams, 1.75¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

Plates.—The demand is improving, both from mill and from stock. Large buyers here have found no difficulty in getting Plates at the lowest prices hitherto current for moderate quantities, but on attempting to order a round lot were asked such an advance as to check the deal. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.75¢ @ 1.80¢; Shell Steel, 2¢ @ 2.10¢; Flange Steel, 2.15¢ @ 2.30¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2.20¢ @ 2.40¢; Flange Steel, 2.50¢ @ 2.65¢; Boiler Tubes, 67½¢. A good demand for Boiler Tubes was experienced during the week, owing to the continued amount of repair work now going on.

Sheets.—A better trade is reported, both in Black and Galvanized Sheets. Manufacturers' agents, who have been reporting business very dull for some time, have suddenly changed their reports, under the stimulus of inquiries from jobbers and manufacturing consumers. Quotations on mill shipments, Chicago delivery, are as follows: No. 27 Common Black Sheets, 2.80¢ @ 2.85¢; Juniata Galvanized, 70 and 10 and 5 %; Sheet Copper, 80 and 85 % off, according to quality. Small lots from stock are selling at 8¢ @ 3.10¢ for No. 27 Common; 70 % @ 70 and 5 % for Juniata Galvanized Iron.

Rails and Car Wheels.—O'd Iron Rails continue to be nominally quoted at \$14.50 in the absence of transactions.

Old Steel Rails are neglected, with nominal quotations \$9 @ \$11, according to lengths. Old Car Wheels are now quoted at \$12.50 @ \$13, with no business reported at these figures. A spot lot which the holder was forced to sell brought only \$10 cash.

Scrap.—Numerous inquiries are being received from Ohio mills by the dealers here. Consumers, however, expect to buy cheap and are offering prices prevailing here for delivery at their mills. It is hardly likely that they will be able to get values down to such a basis. Some movement is reported in Wrought Scrap. Among the local mills the prospect is now in favor of business in this line, and dealers are taking more interest than for the last two months. Nominal selling prices per net ton are as follows: No. 1 Forge, \$10.50; No. 1 Mill, \$8; Sheet Iron, \$5; Pipes and Flues, \$7.75; Axles, \$16; Horseshoes, \$12; Fish Plates, \$14.50; Spikes and Bolts, \$12.50; Cast Borings, \$5.25; Wrought Turnings, \$7.25; Axle Turnings, \$9; Heavy Cast, \$8; Stove Plate, \$8; Malleable Cast, \$8; Mixed Steel, \$9, gross ton; Leaf Steel, \$16.

Metals.—All metals are firmer. Carload lots of Lake Copper are held at 10.25¢; Casting Copper at 9.75¢; Spelter at 3.50¢ @ 3.60¢, and Lead at 3.85¢ @ 3.90¢.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., September 2, 1893.

A correct statement of the condition of the Iron and Steel trade would be the reverse of the ordinary newspaper reports. The volume of business has not increased, but prices have decreased, and that being the case, we fail to see where the improvement comes in. Prices of everything on the list are at the lowest on record, while in some leading specialties the week we have just entered upon brings in new figures, lower than ever made previous to this week. Nevertheless, the feeling is not as depressed as it was a few weeks ago, the reason being that money is getting easier, and there is less fear of suspensions or receiverships. The idea is that the calamity season is pretty well over, and that with the exercise of a little patience genuine improvement will set in; but it is all nonsense to talk of mills having resumed with full work for the usual complement of hands, &c. Such statements are senseless and misleading in the extreme. There is, it is true, fuller employment than there has been at any time within the past three months, but surely that is not saying much, as suspension was almost universal for at least half that time. The outlook is improving. There is more inquiry for material, and it looks as though there would be more business before long, but as an actual reality it is not here yet. Furthermore, the tendency toward a lower level of prices has not been arrested, although it is not unlikely that there may soon be a sudden change, as the danger line cannot be far off, and if once scented it would not take much to produce a "panicky" reaction.

Fig Iron.—The accumulation of stocks has had a depressing influence on prices, and we are informed by large buyers that they have been asked to make bids at lower figures than they have ever bought Iron for up to this date. There is a semblance of steadiness, but when any one likely to take a large lot comes along prices begin to

soften at once. Carload and 50 to 100 ton lots command something pretty close to quoted rates, but on these terms the market is limited, so that quotations do not stand for much in times like these. All depends on the size and financial strength of the buyer, but in ordinary cases asking prices are about as follows for Philadelphia deliveries, and 20¢ @ 30¢ less at such points as Harrisburg, York, Baltimore, &c.: \$12.50 @ \$13, delivered, for Gray Forge, \$18 @ \$18.50 for Plain No. 2, \$18.75 @ \$14.25 for No. 2x and \$14.50 @ \$15 for No. 1x.

Steel Billets.—New prices have been made again, offers to sell at \$22.30 having been made with requests for bids at a trifle less. Some leading concerns claim that these prices are misleading, but, all the same, Pittsburgh Steel is offered at \$22.30, with an intimation that a bid of \$22 for October and November would be taken into consideration. There is not much demand, however, and even at these low figures consumers show very little interest, as they have no market for the product. There ought to be a demand soon, and if there is it would be an easy matter to bring about a sharp reaction, but at present nobody seems to care what prices are.

Finished Material.—There is a slightly improved feeling in Finished Material, based on more inquiry and a little more business without the necessity of reducing prices to any appreciable extent. Most of the business has been done at about the same figures as during August, but that is more because the orders are small and unimportant than because of any inherent strength in the market. As a matter of fact, a good-sized order would be jumped for at quite a material concession, but as there are no such orders there is no jumping, although there are plenty ready to try it as soon as invited. There is nothing in sight likely to change the situation for the present, Pittsburgh quoting prices for deliveries in this and other Eastern markets which are out of all proportion to what they quote in their own territory. Nominally prices are about as followed (delivered), but on large lots special rates are given:

Grooved Skelp, delivered.....	1.50¢	@	1.55¢
Best Refined Bars.....	1.55¢	@	1.60¢
At interior points.....	1.50¢	@	1.55¢
Tank Steel.....	1.65¢	@	1.70¢
Heavy Plates.....	1.70¢	@	1.75¢
Shell.....	1.80¢	@	1.90¢
Flange.....	2.00¢	@	2.20¢

Old Material.—There is no change to note in this department. Prices are irregular, and in some instances lower than they were a week ago. The demand is limited, and under pressure to realize concessions would have to be made from the following, which are the usual asking prices:

No. 1 Wrought Scrap, delivered.....	\$13.00	@	\$14.00
Machinery Cast, delivered.....	11.00	@	11.50
Heavy Steel Scrap, delivered.....	14.00	@	15.00
Old Iron Rails, delivered.....	16.00	@	17.00
Old Street Rails, delivered.....	18.00	@	18.50
Wrought Turnings, delivered.....	10.00	@	11.00
Cast Borings, delivered.....	7.00	@	7.50
No. 2 Light Scrap, new.....	8.00	@	8.50
No. 2 Light Scrap, old.....	6.00	@	7.00

Instead of paying their employees part scrip, as previously arranged, the Falcon Iron & Nail Company, Niles, Ohio, paid all wages for the month of August in cash.

Pittsburgh.

(By Mail.)

Office of The Iron Age, Hamilton Building, }
Pittsburgh, September 12, 1893.

For the week under review there was increased activity among the mills in this vicinity, and during this week one or two more concerns who have been closed entirely since June 30 will again start up on a limited scale. Of course this is very encouraging, and should the concerns now in operation succeed in securing enough orders to warrant operations being continued, the effect will soon be felt in Pig Iron and Steel, for both of which there is very little call at present. Another pleasing feature of the situation lies in the fact that money is undoubtedly easier, and this will act as an incentive to start up small factories which have been compelled to close on account of inability to raise money to meet payrolls and not through any lack of orders. The Oliver Iron & Steel Company and Lockhart Iron & Steel Company have both been entirely successful in starting up with non-union men and have secured competent workmen as fast as places could be found for them. The same is true of the Hainsworth Steel Company, whose plant is now in full operation on single turn and will be put on double turn as soon as the demand for Steel warrants.

Pig Iron.—As yet there has been no improvement in the demand for Pig Iron, but with increased operations among the mills and Steel plants, there should soon be a better Iron market. While production in the Pittsburgh district is lower than at any time since the long Coke strike, it is nevertheless true that stocks are also considerably heavier. Until this condition of affairs is righted by consumption overtaking production and cleaning up these stocks it is not to be expected that prices will show any improvement. The closing of the Rail mills has also knocked a large hole in consumption, and no improvement from this quarter can be expected for some time. In the Mahoning and Shenango valleys the same condition of affairs prevails, nearly all the furnaces having considerable Iron piled up. We quote as follows:

Neutral Gray Forge.....	\$11.75 @	cash.
All-Ore Mill.....	11.75 @	\$12.00
Bessemer Pig.....	12.25 @	12.50
No. 1 Foundry.....	13.00 @	13.25
No. 2 Foundry.....	12.00 @	12.25
Charcoal Foundry No. 1.....	15.00 @	16.00
Charcoal Foundry No. 2.....	14.00 @	15.00

Billets.—During the past week Steel makers have shown more anxiety to capture business, and, as a result, are offering to make concessions in prices, in order to secure contracts. As yet, however, no very large orders have been captured, but negotiations for a round block or two are now going on and may be closed at any time. As announced elsewhere, the Duquesne Steel Works have again started up, and with this concern running the four plants in this city are all making more or less Steel again. In the Wheeling district two concerns are running, though not to full capacity. We quote the market at \$19.50, f.o.b. at makers' mill, and under very desirable conditions, with terms of payment satisfactory to maker, it is possible this price would be shaded to slight extent.

Finished Iron and Steel.—There is little of interest to note this week. While the volume of business does not show material gains, there is a slight increase perceptible on some lines which is quite encouraging. This applies par-

ticularly to Beams and Channels, in which there has been a very fair movement for the past two or three weeks, but in some cases sales were effected by reason of makers agreeing to make concessions in prices. While we do not quote Beams and Channels below 1.60¢, it is claimed that on two or three good-sized orders recently this price was shaded from \$2 to \$3 per ton. In Plates there is a fair demand, with no very large contracts placed for some time. One or two mills in the Mahoning Valley have already made overtures to their men looking to resumption of operations, and it is not improbable that operations will be resumed on a limited scale in some of the plants during this month. While we do not make any change in quotations over last week, it should be noted that all along the line, where exceptional contracts are offered, concessions are frequently made. We quote Beams and Channels, up to 15 inches, at 1.60¢ @ 1.70¢ f.o.b. cars, Pittsburgh; Angles and Universal Plates, 1.60¢ @ 1.70¢; Tees, 1.65¢ @ 1.75¢; Z-Bars, 1.70¢ @ 1.80¢; Tank, 1.60¢ @ 1.65¢; Shell, 1.70¢ @ 1.80¢; Flange, 1.80¢ @ 1.90¢; Ordinary Fire Box, 2.25¢ @ 2.50¢; Special, 3¢ @ 4¢; Machinery Straightened Tire Steel, 1.80¢ @ 1.85¢; Toe Calk, 2.05¢ @ 2.10¢; Hammer Lay Steel, 2.90¢ @ 3¢; Open Hearth Spring, 2¢; Sleigh Shoe, 1.80¢; Bessemer Machinery, 1.80¢; Steel Bars, 1.40¢ at mill, with Bar Iron extras. Bars in the Mahoning Valley are held at 1.40¢, half extras, at mill. No. 24 Soft Steel Sheets, 2.50¢; No. 26, 2.65¢; No. 27, 2.75¢. Galvanized Sheets we quote at 70 and 10¢ in carload lots and 70 and 7½¢ in less quantities.

Ferromanganese.—The resumption of operations among the Steel plants is expected to result in some business before long. In the absence of sales we continue quotation of \$57 for domestic.

Rods.—The outlook for Rods has materially brightened during the past week or so owing to resumption of operations of a number of Wire-Nail mills. As yet no actual business has been done, but inquiries are in the market for one or two fair-sized orders. We quote at \$27.50 at makers' mill. A desirable order might shade this price to some extent.

Pipes and Tubes.—We are advised that one or two fair-sized contracts for Line Pipe are in the market, and may be closed within a short time. There is also a fair demand for the smaller sizes, and the volume of business is somewhat heavier than for some time past. Prices are feeling the effect of increased inquiries, and as stated last week, manufacturers are not inclined to name as low prices as they were a month or so ago.

Muck Bars.—As yet there is nothing doing, but the improvement noted in Pipes and Tubes is expected to lead to some business in Muck Bars before long. We continue quotation of \$21 at buyers' mill for best grades.

Barb Wire.—One local concern that has been idle for some time has resumed operations, though not running full. Stocks of Barb Wire in this city have been thoroughly used up and as already stated, a number of buyers have placed orders at Western points. We quote Four-Point Galvanized in carload lots at \$2.35 @ \$2.40, with the usual advance for less quantities. Plain Wire is unchanged and we continue quotations of \$1.60 @ \$1.65 in carload lots at mill.

Wire and Cut Nails.—A good many inquiries are reported as being in the market, and stocks are very much lower than for a long time past. However, during the past week one local concern and two or three others west of here have again resumed operations to a limited extent. We continue to quote Wire Nails at \$1.40 in carload lots at mill.

Coke.—For the week ending September 2 there were 3311 ovens in the Connellsville region in blast and 14,038 idle, with a total estimated production of 30,025 tons. We continue to quote Furnace Coke at \$1.20 @ \$1.25 per ton of 2000 lb, f.o.b. cars in Connellsville region. However, this price is shaded occasionally, a case in point being that of a smaller operator who quoted a customer \$1.20 per ton, and the order was taken away from him by a larger producer who shaded this price. Foundry Coke is in better demand, and is held at \$1.50 to dealers and \$1.65 to consumers.

St. Louis.

(By Telegraph.)

Office of The Iron Age, }
Bank of Commerce Building, }
St. Louis, September 13, 1893.

Pig Iron.—A slight improvement in the demand is noticeable and there is less disposition to hold back shipments than at any time during the past three months. Consumers are not as yet buying heavily, but if trade continues to improve as it has done during the past ten days an early replenishing of stocks will be in order. The stove trade particularly are very busy just now, and will continue so for the balance of the year and will, of course, be large consumers of iron. Prices are being fairly well maintained, and there are but few job lots now offered for sale. Quotations are as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry.....	\$13.25 @	\$13.50
Southern Coke, No. 2 Foundry.....	11.75 @	12.00
Southern Coke, No. 3 Foundry.....	11.25 @	11.50
Southern Gray Forge.....	10.50 @	10.75
Southern Car Wheel.....	17.50 @	18.00
Lake Superior Car Wheel.....	16.75 @	17.25
Ohio Softeners.....	16.00 @	16.50
Missouri Charcoal, No. 1 Foundry.....	13.00 @	13.50

Bar Iron.—A good trade is reported by jobbers, with prices unchanged. Mills quote 1.50¢, half extras, f.o.b. cars East St. Louis. Jobbers ask 1.70¢ @ 1.75¢ for lots from store.

Barb Wire.—Trade in Barb Wire is gradually improving, although prices do not show any indication of advancing. Mills quote \$2 for carload quantities of Painted. Jobbers ask \$2.10 @ \$2.15 for small lots of Painted to the country. Galvanized commands the usual 40¢ per cwt. additional.

Wire Nails.—Continued improvement is noted in this department. Mills are holding firm at \$1.55 and report a good trade at that price. Jobbers quote \$1.65 for lots from store.

Rails and Track Supplies.—No improvement can be reported in Steel Rails, which continue to be quoted at \$30 @ \$31. Track Supplies are also unchanged, as follows: Splice Bars, 1.65¢ @ 1.70¢; Spikes, 1.90¢ @ 1.95¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Old Iron Rails are nominally quoted \$15.

Pig Lead.—The market has eased off somewhat since our last report and

sales are now made at 3.75¢. Sellers are not disposed to part with their holdings at this price and ask from 3.80¢ to 3.85¢. The market is strong and 4¢ will probably be reached before many days.

Spelter.—A slight improvement is noticeable in this metal. A few hundred tons have changed hands at 3.45¢, although at this price there is not much offering. Stocks of Spelter are not very heavy and as production has been largely curtailed a moderate buying movement would send Spelter upward.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
New York, September 13, 1898.

Pig Iron.—The market continues very quiet, and some sales agents observe even that consumers have again withdrawn. Reports of exceptionally low transactions, notably for Southern Iron, are gaining currency and transactions on the basis of less than \$7 for Gray Forge, at Birmingham, are talked about. There is now being offered by bankers, who a year ago advanced \$6 a ton on Southern warrants, lots of No. 2 and No. 3 Southern Foundry and some Gray Forge aggregating a little over 5000 tons. It is reported also that a considerable block of Charcoal Iron is to be offered at auction in this city at an early date by a bank which had advanced on the iron. Happenings like these are not likely to encourage confidence among buyers. To this must be added the fact that quite a number of Northern furnaces which formerly made exclusively all ore metal are using increasing quantities of cinder and are cutting prices accordingly. We quote Northern brands \$14 @ \$15 for No. 1; \$18 @ \$14.25 for No. 2; \$12.25 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$12.25 @ \$14.25 for No. 1; \$12.25 @ \$13.25 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

Spiegeleisen and Ferromanganese.—There is no business to report.

Billets and Rods.—The market is very dull and lower on domestic Billets. In one case a leading buyer is taking deliveries long postponed. We quote nominally: Domestic Billets, \$22.50 @ \$24, and foreign Billets, \$28 @ \$28.50, tidewater; domestic Wire Rods, \$30 @ \$31, and foreign Rods, \$30.50 @ \$40.

Steel Rails.—No new business has been taken by the mills. On the contrary, there have been further postponements and cancellations on standard Rails, and the same is true for Street Rails, delivery on a large order in New Jersey having been stopped lately.

Track Material.—We quote: Spikes, 1.70¢ @ 1.90¢; Fish Plates, 1.45¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered.

Manufactured Iron and Steel.—Although no large orders have been given out in architectural work there is a little more cheerful feeling, and inquiries are a little better. An Eastern mill has captured a \$200,000 contract for canal locks for the West for the Government, the order including also some heavy Steel Castings. So much work has been delayed during the past few months that a considerable part of it seems bound to turn up before the close

of the season. But beyond the next two months the outlook is gloomy, because usually, at this time, the finishing mills accumulate enough business to run till the end of the year. There seems little hope of that now. There is quite a buying movement in Cotton Ties, which are selling at 70¢ @ 70½¢ per bundle, at mill. We quote: Beams up to 15-inch, 1.75¢ @ 2¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.70¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.80¢ @ 2¢, on dock. Steel Plates are 1.65¢ @ 1.90¢ for Tank; 1.90¢ @ 2.10¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.60¢ @ 1.9¢, on dock, and Common, 1.45¢ @ 1.60¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.75¢ @ 2.10¢, delivered; Steel Axles, 1.70¢ @ 2¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ per bundle, at mill.

Old Material.—We quote nominally Old Iron Rails at about \$15 @ \$15.50; Old Steel Rails, \$12.50 @ \$13; No. 1 Wrought Scrap Iron at \$14 @ \$14.50, and Car Wheels at \$11.50 @ \$12.

Stock Warrants.—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard July 31, 1893.....	78,300
Put in yard for 31 days ending August 31, 1893.....	3500
Total.....	81,800
Withdrawn 31 days ending Aug. 31, 1893.....	1,400
Net stock in yard August 31, 1893.....	80,400

Metal Market.

Copper.—The condition of the market is practically the same as was outlined in last week's report. New export purchases have been on a smaller scale and the home trade buying makes only a fair showing, but deliveries have cut deeply into surplus stocks, besides taking up a good percentage of current production. Prices are firmer and, upon the whole, rather higher, not only for Ingot, but for furnace material. Several hundred thousand pounds of Lake Superior Ingot have been sold at 9½¢. That price was subsequently bid and refused. At this writing 9½¢ @ 10¢ are the popular quotations. Electrolytic is now about 9½¢ @ 9½¢, while 9½¢ seems to be an inside price for common casting brands. Matte is about ½¢ higher, also, and offered more sparingly.

Pig Tin.—There has been a further advance in prices, and, while speculative deals have figured with no prominence, enough Tin has moved out from first hands to strengthen the position here considerably and materially reduce the margin of difference between prices for current month and later deliveries. A week ago November delivery commanded 0.55¢ per lb more than spot stock. At the present time the difference is not over 0.20¢ and the early deliveries seem to be relatively the strongest. There has been a good, healthy consumptive demand, involving nearly, if not quite, as much Tin as usually passes from first hands at this season of the year. At the close of the week prices were up to about 20.15¢ for current month delivery, 20.30¢ for October and 20.50¢ for November, Exchange terms.

Pig Lead.—Limited offering and very fair demand have combined to bring

about a further advance in prices. Good-sized lots of Common Domestic have been sold for prompt and near future delivery at from 3.85¢ up to 3.93¢, and the offering at less than 4¢ is now extremely light. Some lots could have been secured at 3.95¢ from second hands. Consumers are more liberally supplied than they have been for some time past, but all accounts go to show that stocks at producing points are unusually low, and the indications seem favorable for a firm market during the balance of the year.

Spelter.—Sales in this quarter have not been equal to those reported last week, but a very fair business has been effected in a quiet way and the market shows quite firm tone. Ordinary Western brands would readily bring 3.77¢ @ 3.80¢ for early delivery. Speculative bids of as high as 3.85¢ @ 3.87½¢ have been made for distant future deliveries. Choice brands are held at the usual premium and have met with rather better sale.

Antimony.—About the usual jobbing business has been passing and the market is quite steady. We quote at 9½¢ @ 9½¢ for Hallett's, 10¢ @ 10½¢ for L. X., and 10½¢ @ 10½¢ for Cookson's, in round lots.

Tin Plates.—A fair business has been done in ordinary Cokes and Charcoal Terns for prompt delivery, but otherwise the market remains rather dull, with prices somewhat irregular, but showing no radical change. Spot quotations are about as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$3.20; J. B. grade, do., \$5.27½; Bessemer full weight, \$5.20; light weights, \$4.85 for 100 lb, \$4.80 for 95 lb, \$4.65 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; LX basis, \$6.75. Charcoals—Melyn grade, IC, \$6.25 @ \$6.87½; Crosses, \$8; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.70; Crosses, \$6.85. Charcoal Terns—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15; Dean grade, 14 x 20, \$5.80 @ \$5.87½; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.32½ @ \$5.85; do., 20 x 28, \$10.40; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$8.90; Abercane grade, 14 x 20, \$4.60; do., 20 x 28, \$8.80.

Financial.

Notwithstanding the fact that the Senatorial debate on the Silver Purchase Repeal bill continues to drag itself slowly along, with little prospect of immediate action, the general conviction that its ultimate success is assured has, with other favorable features, contributed to still further improve the money situation during the past week. The conditions that created financial stress have now in the main passed away, and the feeling of confidence appears to be stronger than at any time for several months past. The weekly statement of the Associated Banks of New York, issued on Saturday, realizing as it did favorable anticipations, has tended to the maintenance of a better feeling. It showed that the deficit below the 25¢ reserve is wiped out and that the banks now hold nearly \$8,000,000 above legal requirements. Loans had contracted \$3,200,000; specie increased \$2,400,000, and legal tenders \$2,077,900, while cir-

ulation increased \$1,297,800. Deposits, however, showed a slight decrease, which was the only unfavorable feature of the statement. This comparatively rapid recovery of the New York banks from their reduced condition of a few weeks ago is regarded as a very significant proof of the decided easing in the financial situation, and a gratifying feature of the event is the fact that not one of the Clearing House banks has failed during the crisis. Out of town financial institutions have been liquidating their obligations to the New York banks to a very large extent, and the flow of currency to this center has increased so far that money is again in abundant supply, and a large cancellation of Clearing House certificates is looked for in the near future. A sign of the increased circulation of currency is noticed in the fact that on Tuesday the proportion of cash issued in settlements at the New York Clearing House was over 65%. Chicago banks are now beginning to ship currency largely to New York, New York exchange at Chicago being at a premium.

The general business situation, so far as regards the industries of the country, remains in about the same condition as was noticed last week; that is to say, a resumption of numerous works on the prudent basis of shorter hours or reduced wages and a material decrease in the tale of mills and factories closing down or suspending operations. Trade is generally reported as better throughout the country, although there is no boom in any quarter, and this may be regarded as holding a better promise of steady and permanent improvement than if the whole manufacturing and business interests of the country had been sent upward with a sudden rush. As it is, with available funds becoming daily more abundant, a gradual return to prosperity may be reasonably looked for before the close of the year.

The earnings of 92 railroads in August showed a falling off of 10.6 per cent. from those of the same period last year, and for the fourth week of the month a falling off of as much as 16 per cent. As an offset to this poor showing, however, latest advices regarding the Western roads indicate a decided improvement both in freight and passenger traffic since the first of the current month, and it is thought that the corner with them has now been turned. It is expected, nevertheless, that both the wheat movement in the Northwest and the movement of cotton in the South will be slow for several weeks to come, owing to the disinclination of the growers to part with their produce until an expected rise in prices of a material character develops.

New York Clearing House loan certificates to the amount of \$1,345,000 have been withdrawn during the past week, leaving the amount now outstanding at \$38,935,000. Some certificates have also been retired in Boston, and it is considered certain that when the Silver Repeal bill is actually passed by the Senate a very large proportion of the outstanding certificates, which now amount to about \$65,000,000, in the clearing houses of the principal financial centers of the country, will be immediately canceled. A small amount more of gold has been received from abroad during the week, making the net imports since January 1 \$55,621,165, against \$68,727,171 exported during the same period.

Money on loan is decidedly easier. Rates for call loans on stock collateral have ranged from 2½% to 4½%, averag-

ing 3½%, with renewals generally at about 3½%. Few of the banks, however, figure prominently in the call loan market. One feature of the past week has been the better condition of the market for time loans, which are now fairly easy, although the supply is not yet very abundant. Six per cent., flat, is the usual rate, and it is said that a considerable amount of time money has been put out by trust and insurance companies at this rate for 60 days to a year, but only on first-class securities. Some borrowers with inferior collateral are, however, willing to pay a moderate commission in addition, and these securities do not command money for more than 30 to 60 days. Buyers of commercial paper are more numerous, and the market for this medium has shown more movement during the past week; 8% is quoted for the better class, double-named, but 10% @ 12% represents the rate charged on ordinary paper.

Foreign exchange has been quiet and lower. The rate for sterling was on Tuesday posted down, the demand from remitters being less active, while the supply of commercial bills has improved. Actual business was done at 4.81½ @ 4.82½ for 60 days, 4.84½ @ 4.85½ for demand, 4.85½ @ 4.86½ for cables and 4.81 for commercial. Domestic exchange in New York is quoted as follows: New Orleans—Commercial, 2.00 premium; bank, 3.00 premium. Charleston—Buying, ½ discount; selling, par. San Francisco—Sight, 20; telegraph, 30 premium. Savannah—Buying, ½ discount; selling, par. Boston—40¢ @ 50¢ discount. Chicago—70¢ premium. St. Louis—\$1.10 premium.

Advances in about all lines of securities marked the course of the Stock Exchange during the week ending last Saturday, and, with the encouragement afforded by the favorable bank statement, the buoyancy was carried over to Monday, when a further sharp rise was experienced on most of the active stocks. Even the "grangers" advanced in spite of the poor crop reports, the records of lessened earnings on several of the roads and brisk selling of American railroad securities by London. This tends to show that confidence in the approaching vote of the Senate against silver purchase has begotten confidence in Wall street. The market reacted a little, however, on Tuesday, when a dull and feverish tone pervaded it, and at the close a sharp decline in some of the more active stocks took place, the dealings being principally concentrated in the three properties which have been particularly prominent of late—namely, Sugar, Chicago Gas, and St. Paul. Signs are noted that a reviving interest is being taken by Wall street in Richmond Terminal securities, due to the report of an imminent reorganization of that road. The scarcity of stocks during the past few days has been a very noticeable feature, pointing to the conclusion that either the short interest has still failed to complete its coverings, or that buyers are largely taking their purchases out of the market. In the following list is shown the fluctuations of some of the principal stocks since Thursday, September 7, with the closing prices on September 13:

	High- est.	Low- est.	Closing, Sept. 13.
Am. Sugar Ref.	93½	87½	90½
Atchafson, T. & S. Fe.	22½	19½	20½
Balt. & Ohio.	69	68	69½
Chicago Gas.	64½	56½	60½
Chicago & N. W.	101½	98½	100½
Chic., B. & Q.	86½	83½	84½

Chic., Mil. & St. Paul.	63	58½	61½
Chic., Rock Isl. & Pac.	66½	63	65½
Del., Lack & Western.	142½	138½	142½
Gen. Electric.	48½	48	45½
Lake Shore.	123½	120½	122½
Louisville & Nashville.	57½	54½	55½
Manhattan.	134½	129½	131½
Missouri Pacific.	28	24½	26½
Minnesota Iron, asked.		29½	31½
National Lead, Common.	32½	30½	31½
New York Central.	103½	101½	101½
N. Y., L. E., & Western.	16½	14½	16½
Northern Pacific, Pfd.	25½	23	25
Philadelphia & Reading.	21½	18½	19½
Richmond & West Pt., Term.	3	2½	3½
St. Paul & Omaha.	36½	33½	35½
Union Pacific.	24½	22½	23½
Western Union.	84½	81½	83½

Government bonds are firm. The last sales at the board were \$2000 coupon 4's at 111½. Closing prices are given as follows:

	Bid.	Asked.
4s, 1907, registered.	110½	111½
4s, 1907, coupon.	111½	112½
2s, registered.	99½	...

The railway and miscellaneous bond market has become quite active and buoyant, a specially encouraging sign even to those who do not believe in the rapid rise in stocks. Prices have advanced in most issues since the last report.

Bar silver closed in London on Wednesday at 34½ pence ½ ounce, and in New York at 74½¢ ½ ounce. The last Treasury purchases of silver were 21,000 ounces at 75.40¢ ½ ounce.

The September crop report issued by the Government is not at all a favorable one. It affirms that one-eighth of the corn, or 215,000,000 bushels, was destroyed by drought in August, and that 13.3% of the winter and spring wheat was similarly destroyed, while the estimated yield of other cereals is also cut down. The injury to cotton in the month will, according to the report, diminish the yield 8.7%. That these estimates are not entirely relied upon is shown by the small effect the unfavorable news has had in Wall street; but the report has had the effect of hardening to some extent the grain market, corn especially having grown stronger during the past few days, while wheat is quoted several points higher. An increase in the crop movement during the present week and a temporary apathy in exporters' interest have served to bear down the price of cotton to a considerably lower level than it had reached last week.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, September 13, 1893.

There has been a decided increase in the volume of business in Pig Iron during the week, which is evidently the result of a more confident feeling which pervades the trade and the better condition of the financial situation. Some buyers who have long contemplated taking advantage of the low prices current have bought some round lots of Pig Iron, and the sales in the aggregate were upward of 20,000 tons, mainly of Nos. 2 and 3 Foundry Iron and Gray Forge. The sale was partly for spot cash, Gray Forge going at \$7, No. 2 Foundry at \$8.25 and No. 3 Foundry at \$7.50, spot cash and for prompt shipment, and 25¢ @ 40¢ ½ ton more for delivery the remainder of this year and one month into next year, f.o.b. Birmingham. Gray Forge Iron is comparatively scarce, and there was one sale at \$7.40, f.o.b. Birmingham, for delivery up to and including January, 1894. The buyers were mainly agri-

cultural works. If the demand keep up there will soon be a scarcity of iron in the South, for so many of the furnaces are out of blast that stocks are already at a low point. In fact, there is now more competition with the Northern furnaces than there is between the Southern furnaces. Besides the above sales there was rather more than the usual run of orders for carload lots, and there was a fair run of Eastern orders. There is no movement in Charcoal Iron. Quotations as follows:

Foundry.

Southern Coke, No. 1.....	\$12.75 @ \$13.00
Southern Coke No. 2.....	10.75 @ 11.00
Southern Coke No. 3.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 14.75
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2.....	17.50 @ 18.00
Tennessee Charcoal, No. 1.....	14.00 @ 14.25
Tennessee Charcoal, No. 2.....	13.00 @ 13.25

Forge.

Gray Forge.....	10.00 @ 10.25
Mottled Coke.....	9.75 @ 10.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	17.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.00 @ 17.25

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, September 13, 1893.

Pig Tin prices gave way slightly early in the week owing to restricted demand and some pressure to sell, but latterly there has been a rise to £80. 5/ for prompts, with rather more active speculation. Consumption is still rather quiet, and dealings in futures are mostly between regular operators, there being little outside interest. Latest dealings in Straits were at £80. 10/ @ £80. 15/ for prompts and £81. @ £81. 2/6 for three months' futures.

Copper has been rather irregular, yet without radical change. Under the influence of slow buying and some pressure to sell there was temporary weakness in prices, but restricted offering in connection with better American advices brought about a reaction. American Copper is less freely offered, and bids on Argentiferous Matte have been raised to 8/10½. At the close the market was firm, with Merchant Bars quoted at £43. 2/6 for prompt delivery and £43. 10/ for three months' futures, and Best Selected English at £47. 5/ @ £47. 10/.

Tin Plate market has undergone very little change. Demand has been meager and stocks at Swansea have increased to 261,000 boxes in the face of stoppage of several works. Exports last month were 25,000 tons, against 32,000 tons in August, 1892. The quantity sent to the United States was 15,000 tons, against 24,000 tons last year. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....	12/9 @ 13/3
IC Bessemer Steel, Coke finish.....	11/8 @ 11/9
IC Siemens.....	11/9 @ 12/
IC Coke, B. V. grade, 14 x 20.....	11/6 @ 11/9
Charcoal Terne, Dean grade.....	11/6

Pig Lead is firmer at £9. 15/ @ £9. 17/6 for Soft Spanish, but only a fair

business is passing and the demand continues moderate.

Spelter is again somewhat higher, being now held at £17. 5/ @ £17. 7/ 6 for ordinary Silesian and in moderately active demand.

Exports of Pig Iron last month were 96,000 tons, against 83,000 tons in August, 1892. The market is firmer. Last dealings in warrants were at 42/7 @ 42/8 for Scotch, 35/3 @ 35/4½ for Cleveland, and 45/3 for Hematite. The market for manufactured Iron and Steel remains quiet, with prices very much the same as they have been for several weeks and rather soft.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., September 12, 1893

The tariff is beginning to become involved in the silver struggle in the Senate. The silver State Senators, who have always been rated as Republicans, have been throwing out hints that if their party colleagues permit them to be slaughtered by voting against the interests of silver, if forced to a vote, they will retaliate by voting against the maintenance of the protective policy toward other industries. They claim that silver is just as much entitled to protection against adverse legislation at home as iron and steel, textiles and other manufactures are entitled to protection against adverse interests abroad.

This threat of the free-silver Republicans in the Senate is replied to by the reminder that these same Senators did turn their backs on the tariff by voting against the so-called Force bill under a bargain with the then minority, now the majority, in the interests of free coinage.

Senator Allison, speaking of this new phase of the parliamentary contest over silver in the Senate, said to-day: "It makes very little difference how these gentlemen, who are threatening, will vote. They went back on us once and their support now would not give us a majority. We can afford to try issues on that score." The present condition of the silver struggle does not promise a very early solution of the existing difficulties. Chairman Wilson of the House Committee on Ways and Means feels confident that the revenue tariff reform bill will be completed for report to the House by the last days of October. From the present outlook it will pass the House and get to the Senate before silver is out of the way.

Receiver McGettigan of the Premier Steel Works, Indianapolis, Ind., who failed some time ago, has filed a report showing the assets of the concern to be \$2,014,698 in May. The inventory of stock shows \$181,992. The outstanding liabilities are \$800,000.

Warwick anthracite furnace, at Pottstown, Pa., under the management of Edgar S. Cook, president, has outdone its previous records. During the week ending September 9 the furnace produced 1104½ gross tons of gray forge iron, with a fuel consumption of 1955.6 pounds per ton of iron, the ores yielding 60.81 per cent., the limestone per ton of iron being 1084.8 pounds and the

average temperature of the blast 1144°. The ore mixture consisted of 75 per cent. of New Jersey and New York magnetite, 12½ per cent. heating cinder, and 12½ per cent. of Lake ores. Considering the character of the ore and limestone required, it is believed that this record will compare with the best coke practice.

The Richardson & Morgan Company's foundry at South Norwalk, Conn., has been attached for \$25,867 upon the application of Charles T. Ayer of New York, who is said to be the principal creditor. The company's last report to the Comptroller was as follows: Capital, \$75,000; personal estate, \$187,768; debts, \$216,673; credits, \$80,132. It is not known whether business will be resumed.

George W. Gogin has gone to San Francisco to take charge of the steel plant of the Pacific Rolling Mill Company.

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HARDWARE.

Condition of Trade.

THE IMPROVEMENT which has been perceptible for the past few weeks still continues, and there is a noticeable increase in inquiries and in business. Most of the mills and factories which have been closed have resumed operations and others which have been working on short time are increasing their output. The improvement in the money market is evidently having its effect both on trade and collections.

With a view to ascertaining the condition of things among the trade throughout the country we have recently addressed inquiries to representative Hardware merchants among our subscribers in every State and Territory in regard to the volume of trade, character of stocks, prospects for business, &c. The replies to these inquiries have brought out a mass of definite and detailed information in regard to business in all sections and the feeling of the trade in reference to the future. In manufacturing communities merchants have evidently felt the financial stringency more severely than in other sections, and the silver States also report business as very dull. Taking the country as a whole, it appears, however, that many merchants have found trade nearly as good as in previous years. In many sections business was excellent in the spring, but July and August are generally referred to as having been exceptionally dull. In some States, however, business was fair during these months, notwithstanding the financial disturbance. Our correspondents report a general improvement as fall approaches, though merchants are cautious in buying and credits are scrutinized closely by jobbers and manufacturers. A gradual improvement in business is generally anticipated and on a more conservative and healthy basis than heretofore. Comparatively few merchants anticipate the usual volume of business during the remainder of the year.

STOCKS.

A very conservative policy is evidently pursued by the retailers in regard to the stocks of goods which they carry. As a rule stocks are considera-

bly smaller than at this season, and a hand-to-mouth buying is generally pursued. Spring purchases were generally large, but stocks have been cut down as much as possible during this summer, the aim of the merchants being to carry as small an assortment as will meet the requirements of their trade.

PRICES.

Our correspondents report that while a few manufacturers are offering inducements for stock orders in the way of special discounts, the majority prefer to close their factories rather than cut prices, and jobbers also, as a rule, have refrained from urging purchasers. Merchants in many sections having been obliged to ask for extra time and extension, have not been in a position to either purchase largely or to endeavor to obtain lower prices.

COLLECTIONS.

Collections are very generally referred to as having been hard to make, but money appears to be easier during the past two or three weeks. The financial condition, as is well known, being the great obstacle to business, the lack of money which has prevailed and the distrust which has existed have had the effect of largely curtailing trade. Many of our correspondents, however, refer to collections as having been fair, but some of them allude to a disposition on the part of their customers to make the financial disturbance an excuse for deferring payments which it was in their power to make.

PROSPECTS FOR BUILDING.

The general impression is that after the buildings now in course of construction are completed little or no new work will be undertaken. A large amount of building was commenced in the spring, especially in the South, but fall work in nearly all sections of the country will be light on account of the financial stringency. Architects are not planning much new work and building is practically at an end for the year. In some sections work begun in the spring was abandoned in the summer for an indefinite time.

AGRICULTURAL CONDITIONS.

Owing to unfavorable conditions the crops of wheat, corn and other grains are below the average in most sections. There are, however, exceptions, and some States report excellent crops. The fruit crop has been good and has brought fair prices. The hay crop also, in some States, is large and the marketing of it will put a good deal of money into circulation. While prices for farm products are low, farmers are

frequently referred to as in comfortable circumstances, owing to the good crops and good prices during the past two or three seasons. Many of them are referred to by our correspondents as disposed to hold their crops for better prices and as able to do so, as they are not encumbered with liens and mortgages. The effect of this will be to make money scarce with them and curtail their purchases to a considerable extent. Crops will, however, in many cases be marketed without unusual delay, and this will, it is expected, benefit business, as the money finds its way into trade circles.

PROSPECTS OF TRADE.

As a result of droughts and early frosts in some sections, destructive storms in others, short grain crops in the North and Northwest and a small cotton crop in the South, with the low prices which are ruling, and with factories closed or running but part of each week, the outlook for trade during the next few months, especially in view of the financial stringency, could not be expected to be especially promising. In the face of all these discouragements, it is the opinion of many conservative and intelligent Hardwaremen that if no further disaster overtakes the country an improvement in trade is assured. The States depending largely upon a single product, as the South upon cotton, the Northwest upon grain, the Silver States upon mining, &c., will, it is expected, be longer in recuperating than those States which have diversified interests.

Chicago.

(By Telegraph.)

Orders are stated to have increased every day last week for seasonable goods as sold by Shelf Hardware jobbers. The demand for staple goods and for straight Hardware is, however, improving but slowly, although every order contains a greater or less list of this character. The business running so largely to seasonable goods shows that merchants are still ordering only what they must have to meet the immediate or prospective pressing wants of their trade. The demand for Sheet Iron is notably heavy and jobbers are now complaining that their receipts from the mills are by no means up to contract and they are having difficulty in supplying the wants of their customers. The Cordage trade has made a decided gain in activity. Stocks at both factories and in jobbers' hands here were allowed to run so low during the summer that the fall demand has brought on a very heavy movement suddenly, and more orders have been entered during the

Grange and department stores, manufacturers who sell direct to consumers, and jobbers who solicit trade from retailers' customers. The distribution of goods by any of these methods is prejudicial to the community into which the goods come, as it destroys the confidence of the customer in the methods and prices of the local merchant. It deprives the merchant of fair competition, to which every dealer is entitled, besides taking cash out of the town, and returning, in the majority of cases, inferior goods which fail to give satisfaction. Fire has to be fought with fire, and until the retail Hardware dealers' meeting in Chicago results in an organization, or some concerted action is decided upon by the trade, Hardwaremen can afford to meet these outside prices by demanding cash and adding exchange and transportation to the quoted price. They can afford to do this for the sake of holding their customers and keeping the cash at home. It should not require a remarkably smart Hardware merchant to get hold of the latest catalogues of the Grange houses, and with that in his possession he will know what he is working against in quality, assortment and utility. An advertisement in the local papers, stating that prices of Grange and department stores will be met, and better goods furnished for the same amount of cash, would do much toward mitigating the evil. I am thoroughly in favor of organization, and believe united effort will accomplish more than single-handed fighting, but it may be six months or a year before relief will come through this channel; large bodies move slowly. In the meantime, it is suicidal for the merchant to sit waiting for something to turn up, to lose the trade of his townsmen and of the farming community, to carry customers on his books who are sending their cash away from home, and to worry himself to death over what could in a great measure be prevented.

The Bicycle Display at the World's Fair.

(Concluded.)

Foreign Exhibitors.

Having mentioned the wheels made at home, attention is directed to the exhibits which manufacturers from across the water have in place at the fair. England, in particular, is well represented, her exhibit occupying extensive space in the north end of the west gallery of the Transportation Building, across from the American exhibition. Here we find extensive and elaborate displays, made by the Raleigh Cycle Works, Premier Cycle Company, Whitworth Cycle Company, Quadrant Cycle Company, Sparbrook Cycle Company and Warman & Hazlewood.

THE RALEIGH CYCLE COMPANY of Nottingham, England, with a branch factory in this country, are the makers of the Raleigh, and in their exhibit an interesting feature is the display of over 100 trophies, including medals, cups and other prizes won by Zimmerman and other noted riders on that wheel. The machines shown in this exhibit are precisely the same as those exhibited at the Stanley and Nottingham cycle shows in England last fall. They are regular stock machines, half being of English finish and the remainder of American make. The lines of the pattern which they adopted five years ago have been maintained by them up to the present year, and this style is

now known as the Raleigh-Humber pattern. The chief points of the Raleigh are the length of the wheel bore and steering head and the fine amount of rake given to the machine. Another feature is the construction of the ball bearings, embracing a tubular fork, crown and portable sprocket.

THE WHITWORTH CYCLE COMPANY of Coventry, England, have their exhibit along the west wall of the gallery, showing in handsome black enamel the principal machines of their manufacture under the management of Frank Osmond, ex-champion of England. The machines shown at the fair embrace six distinct styles: The full roadster, for heavy riders and rough roads, possessing strength of frame and wheels, thick tubing and allowing comfortable position to the rider; the light roadster, which is 5 pounds lighter than the first wheel mentioned. The light roadster, a modification of the heavier wheel, is really the standard Whitworth, and when stripped of brake and guards answers admirably as a road racing mount. Their regular road racer, however, better known as the Whitworth No. 3, is among the lightest, strongest and fastest road racing machines made. It has light cranks and rat trap pedals, rubber handles and light racing saddle with small springs. Their ladies' wheel includes a decided departure from American patterns in that it has a straight frame of hollow tubing with two bars reaching down from the handle instead of forming the usual curve. The track racer and special No. 8 Whitworth track racer complete the line.

THE PREMIER CYCLE COMPANY of London, England, have a display of racers, roadsters, ladies' wheels, Tricycles and youths' safeties which vies with the other English exhibits for superiority. They are using the patent helical tubing, butt-ended spokes and anti-friction balls. The helical roadster Premier is a full road wheel in every sense except weight, tipping the scales, all on, at 32 pounds, and guaranteed to carry heavy riders over roughest roads with comfort and safety. The Premier racer weighs only 18½ pounds, is constructed of the helical tubing and has the Premier diamond frame and ball bearing steering head. It has the detachable Dunlop tire used on all machines of this make, and its rigidity and strength place it well up toward the lead when its weight is taken into consideration. Other wheels, including a handsome ladies' Premier, complete one of the best English exhibits. The manufacturers announce that the coming 1894 wheel will have tangent spokes in place of the straight ones now used.

THE QUADRANT CYCLE COMPANY of Birmingham, England, with sales offices in Boston and Chicago, show an extensive line of the wheels made by them, of which their No. 18a ladies' safety probably attracts the most attention, owing to the decreased size of the back wheel and extreme distance between saddle pillar and steering post, thus making steering very easy. All their frictional parts are ball bearing, dust proof and nickel plated, with tangent spokes, round sprockets and roller chains. The Quadrant Tricycle is an especially handsome machine of its pattern, and Englishmen show their appreciation in a substantial manner. American riders of the three-wheeled machine preferring a much smaller front wheel. The Quadrant frame is symbolical of strength and grace. Rigidity is not sacrificed to lightness and the result is a fine line of wheels.

THE SPARBROOK MFG. COMPANY of Coventry, England, also have a display of Cycles in the English section of the

Transportation Building. The Sparbrook safeties hold a high position across the water and are not unknown in this country. Probably the chief recommendation for this machine is the differential double-driving axle used on all of their machines. This consists of two shafts equal in length, on which the driving wheels are secured and kept in line by bearings on the axle, suspended by joints from cross bar, the inner ends of the shaft being connected in the center by universal joints to two steel cut pinions which work into each other, placed at an angle of 60°, revolving in bearings formed in a gear box in the center of the axle. The effect of employing this axle is to give a perfect distribution of power in direct proportion to the velocity of the two driving wheels. Samples of their racers, specials, roadsters, heavy and light ladies' wheels and Tricycles are shown in black enamel finishes.

WARMAN & HAZLEWOOD of Coventry, England, are displaying their full line of English-made wheels, including geared ordinaries. On this wheel the seat has an extended spring, comprising ten rungs. The finishes shown are handsome and the trimmings decidedly tasty.

Germany is represented by three of her manufacturers—Heinrich Kleyer of Frankfurt on Main, Adam Opel, from Russelheim, and the Victoria Cycle Works of Nuremberg.

AT HEINRICH KLEYER'S exhibit the racing tandem is an object of much interest. It is his regular tandem No. 3, weighs but 31 pounds, constructed of the well-known Mannesmann tubing, has hollow crank shafts and axles made from solid drop forgings and bored out. The racer made by this manufacturer weighs 19 pounds and is constructed on the most approved lines. Herr Kleyer has supplied several German provinces with wheels for army use. These machines weigh about 45 pounds and are complete with the usual army Bicycle outfit.

ADAM OPEL of Russelheim has a most extensive line of wheels on exhibition. There are geared ordinaries and a regular ordinary with pneumatic tire, any number of regular safeties, and a tandem. Numerous novelties abound in the shape of saddles, dress and chain guards and other attachments.

THE VICTORIA CYCLE WORKS of Nuremberg have the distinction of having the only Cycle exhibit outside the Transportation Building. It is located in the German section of the Manufactures Building, and among other wheels contains a geared ordinary, regular roadster and racer. An object of interest is the patent leather dress guards on the purple enameled ladies' wheel. An invalids' or cripples' Bicycle attracts unusual attention.

France is represented by two of her leading Bicycle manufacturers, Clement & Co. and Hurtur, Hantin & Diligeon, both having headquarters at the French capital.

CLEMENT & Co. show a very fine line of wheels in variegated finishes. Probably the most noticeable feature is the proximity on the ladies' wheels of the steering rod to the saddle support, not allowing the rider as much space and seeming to make mounting and dismounting more difficult than on our American machines.

HURTUR, HANTIN & DILIGEON display a full and complete line of the Hurtur wheels. Their racing machines are exceedingly light, and at the same time sufficient rigidity is given the frame to

answer all purposes on the track. Some half hundred medals tell the story of the superiority of the machine as shown on France's race tracks.

Foreign Letter.

(From our Special Correspondent.)

MADEIRA, August 10, 1893.

To the Editor: There have from time to time appeared in *The Iron Age* sundry letters, pro and con, from merchants and their retail customers regarding exactions made from one on the other, &c.

In England it is not unusual for a customer in remitting to deduct the penny stamp (required by law on his check) from the amount of his bill, and one large retail house has printed on its remittance blanks that since they make all payments by check they require no further receipt, and therefore deduct 2 pence from the amount due, being penny for stamp on receipt and penny necessary to post it.

But in the country remittances are not often made, for goods are bought through the commercial traveler even more generally, perhaps, than with us, and are collected by the traveler on his next journey, as they call it, which is usually about six months later; indeed, several manufacturers print their terms as $2\frac{1}{2}$ per cent 30 days, or payable on traveler's journey net.

Our system of collecting by draft is not at all popular or usual, and even the banks frown on it, the largest bank in London declining to handle such business for a good client, while another bank charged a friend of the writer, who was endeavoring to graft his American experience on English soil, \$5 for trouble and \$2.40 for postage, besides exchange on a series of drafts.

In England the bank keeps the pass-book, not the depositor, who is allowed at stated intervals to look it over, but has no check on his deposit as in our own country.

Speaking of exactions, a New York friend who opened a London office some time ago had his patience pretty well tried at the beginning in the exasperating amount of extras which starting a business there entailed. With us the rent covers all these items, but in London it seems that when you contract to rent a place you must figure on paying nearly 25 per cent. additional in taxes of one sort or another. The Government has $2\frac{1}{2}$ per cent. on the gross profits and sends expert inspectors to see that a fair amount is paid. These burdens don't suit an American at all, not being used to them, nor the endless system of tipping, though that is done on a low basis. Even the carman who delivers your cases of merchandise exacts a tip of a penny a case, which has nothing to do with the cost of the work.

It is a positive fact, however, that in spite of all these petty trials American firms are increasing in London and American Hardware is growing more popular in Great Britain. Some brands of American Shears, for instance, are without doubt as popular in England

as in our own land, and American makers of this class are doing a good business in the "U. K.," as it is always spoken of. An interesting evidence of this is the fact that the London journals related to the Hardware trades have one after another for some weeks had articles extolling the English-made Shears as compared with the American-made goods that have become so popular of late.

Mechanics' Tools also from our side lead in popularity, excepting a very few items—the Canadian factories in one or two lines even have a fair demand.

The fact of anything being American is sufficient to attract interest—the best kind of advertisement.

POLHEMUS LYON.

Trade Topics.

Safe Business.—From a Hardware house in Pennsylvania we are in receipt of the following communication, which refers to an article on this subject by "T. W. F." in our issue of August 24, some of the statements in which are thus controverted by our correspondent:

The writer says that if a merchant sells \$7500 worth of goods in a year at a gross profit of 30 per cent., he has left, after paying \$1132.50 expenses, a net profit of \$1117.50 for personal expenses or clear gain.

I may be wrong, but as I understand percentage I beg to differ in the above statement, and claim that A, B and C's net profits after paying expenses are as follows:

A's, \$598.27 (instead of \$1117.50)
B's, 309.81 (instead of 742.50)
C's, 11.85 (instead of 367.50)

As I understand the questions, I would solve them as follows: If A sells \$7500 worth of goods in a year at a profit of 30 per cent., his goods cost him \$5769.23, which I find by the following method: If \$6500 of sales represent 30 per cent. profit on the goods, then \$7500 is 180 per cent. of the cost of the goods; if \$7500 is 180 per cent. of the cost, then 1 per cent. is \$7500 divided by 180, which is \$57.69.23, and 100 per cent., or the cost of the goods, is \$57.69.23 multiplied by 100, or \$5769.23. If his goods cost him this amount, by deducting it from \$7500 we find he has a gross profit of \$1730.77; deducting \$1132.50 expenses from this, it leaves the merchant \$598.27 net profits.

B and C's accounts would be solved by this same method.

Local Checks.—A subscriber in Colorado refers in the following terms to the discussion which has appeared in our columns on this subject:

I cannot see where the jobber has much to complain of, and, in my opinion, he has considerably the best of the matter, as the retailer has not only freight to pay on his goods, but has also to pay both for hauling the goods from the jobber's store to the depot and for the boxes the goods are packed in. I have an invoice before me now that amounts to \$66, package and drayage on which is 95 cents, almost $1\frac{1}{2}$ per cent., on the cost of the goods, so that if the jobber has sold me one dozen Locks in this invoice for \$2 he will actually charge me \$2.03. It is a poor rule that will not work both ways. Let the jobber pay his own drayage and

package and let the retailer pay his bills in par funds.

Durability of Nails.—A circumstance regarding the lasting qualities of Cut Nails as compared with Wire Nails has been brought to our notice by a New York State Hardware firm, which will be of interest to the trade. As related, a mill was re-roofed five years ago, Steel Wire Shingle Nails being used on the job. About a year ago the owner of the mill brought to the firm a board taken from the roof, in which was one Cut Nail and a number of Wire Nails. The Cut Nail, we are informed, was as good as the day it was driven, while the Wire Nails were almost all rusted away, and some of them were entirely gone. The informant thinks the board was hemlock. The owner of the mill was obliged to re-nail the whole roof. This brings up the question as to the relative durability of Wire and Cut Nails, a point on which we should be pleased to have further information.

Hold-Back Hinges.—We are in receipt, from a correspondent, of the following inquiry with reference to the utility of Hold-Back Hinges, which we take pleasure in referring to our readers:

We have been very curious to find out what there is to be gained by the use of a Hold-Back Hinge on Screen Doors. The question has been discussed in our locality, and particularly with our travelers. There is evidently a demand for such a Hinge, but nobody seems to be able to tell us why Hold-Back Hinges are sold. As we understand it, a Spring Hinge is applied to a Screen Door to keep it constantly closed, and Screen Doors are generally used for the purpose of ventilation, and they also prevent insects—such as flies—from coming into a room. We should be pleased to have an expression from the trade on this question.

Dishonoring Drafts.—Referring to the article on this subject which appeared in these columns a few weeks ago, we have the following communication from a manufacturing house in Western New York. Our correspondents allude to the annoyance to which merchants and manufacturers are subjected by the failure on the part of their customers to honor drafts which are made upon them:

We notice your article in issue of August 10 on "Dishonoring Drafts." It is very much to the point and covers the ground. This is a very annoying practice. We have a house in Canada and we find a great difference between our experiences in the two countries in this way. In Canada we can put in for deposit with our bank sight drafts for any overdue accounts, with the almost certainty that these drafts will be paid when presented to the drawee. In this country a large number of the drafts are returned unaccepted, notwithstanding that notice has been sent at least ten days previous to making the draft. We make a practice ourselves of paying any draft made upon us, even although it may be slightly incorrect; as we feel that the necessity for drawing was caused by our not having remitted on the date when the account was due.

Trade Items.

A NOTICE APPEARS in this issue of an auction sale of 10,000 cases of Gray Enameled Opal Ware and Blue and White Ware, at 12 Murray street, New York, by the Lalance & Grosjean Mfg. Company through E. Bissell, Son & Co. The Gray Enameled Ware will be stamped Opal, and will be equal, it is stated, to the samples shown. The goods will be sold in case lots. This is, we are advised, the largest offering ever made by the above company and will be worthy the attention of the trade.

J. A. PAINCHAUD, of Painchaud, Squire & Co., Montreal, sailed from New York, September 13, by steamer "Majestic" for a trip through the Hardware manufacturing districts of England, Belgium, France and Germany.

THE ADVANTAGE of handling specialties and goods which allow a better profit than staples is thus referred to in the closing paragraph of a brief circular issued by the W. Bingham Company, Cleveland, Ohio:

That "a bird in the hand is worth two in the bush" may be all right in a general way, but a hungry man will go gunning for goose even if he has a caged robin; and a wise Hardware merchant will not try to build up a business or make a fortune by selling staples alone.

THE SEATTLE HARDWARE COMPANY, Seattle, Wash., are being represented in Eastern Washington and Oregon by J. A. Peebles.

ATTENTION IS DIRECTED to the full-page advertisement of the Wilmot & Hobbs Mfg. Company, Bridgeport, Conn., and 20 Murray street, New York, which appears in this issue. The space is largely devoted to a showing of their copperized Swedoh steel anti-rust Oilers, which are made in a large variety of styles. The Oilers are heavily copper-plated inside to prevent rusting and the oil becoming gritty.

WARREN D. ROLLINS severed his connection with the Enterprise Mfg. Company of Philadelphia on September 1 and will hereafter be connected with the Yale & Towne Mfg. Company, in whose interest he will visit his friends in the trade east of Cleveland.

C. D. McDOWELL, with headquarters at Dorchester, Mass., has recently commenced traveling in New England for Allerton-Clarke Company, 83 Reade street, New York, eastern agents for the Arcade File Works and other well-known concerns.

GILBERT & SHERIDAN, dealers in mill and machinists' supplies, who last May established themselves at 48 Centre street, New York, have been made agents for the Crescent Mills Emery, made by Standard Emery Wheel Company. A full line of Emery, Emery Wheels, &c., is now carried in stock by them.

THE ADAMS & WESTLAKE COMPANY, Chicago, are sending out a handsome card for hanging, upon which is an engraving of the Empire Brass Bedstead displayed in their exhibit at the World's Fair. This Bed, which is among the most artistic of their numerous patterns, is made especially attractive by being gold plated and elaborately draped with appropriate hangings.

WOOLEY & Co., 61 Fulton street, New York, manufacturers of plain and ornamental Wire, Iron and Brass Work, have just completed a unique sign, to be swung in a show window on Broadway, with a plate-glass mirror back of it. It will be suspended by three chains from a central mytholog-

ical metal head, flanked on each side by two rosettes. Between the upper and lower scroll work are the words "The Emerson Shoe" in script, made of solid polished copper. The scroll is of brass in a dark color known as Japanese finish. They have also prepared some very fine grille work in Japanese finish to be used around the cashier's desk, &c., in the same establishment.

IT IS ANNOUNCED that awards in the Department of Manufactures at the World's Fair have been made to the Stanley Rule & Level Company, Stanley Works, Russell & Erwin Mfg. Company, New Britain, Conn.; Meriden Britannia Company, Meriden, Conn.; Wm. Rogers Mfg. Company, Hartford, and Holmes & Edwards Silver Company, Bridgeport, Conn.

JULIUS PFAU of Mannesmann Tube Company, Limited, Landore, South Wales, England, accompanied by D. B. McInwaine of 111 Chambers street, New York, who represents them in this country, has been visiting the different Bicycle manufactories of the country in the interest of their Patent Weldless Tubing, particularly adapted for Bicycles. Mr. Pfau sailed for home on the "Saale" Saturday, September 9.

THE UNION METALLIC CARTRIDGE COMPANY are offering the "Nitro Club" paper Shells, which have just been brought out. These shells are designed to meet the demands of dealers and users of nitro powders for suitable shells at moderate cost. The quality is said to be the same as their new club Shell, with special strong primer and a new form of base, insuring quick ignition and strong combustion to moderate charge of nitro powder. These shells will only be supplied empty during the present season. The list for 12 gauge, 2 $\frac{1}{2}$ and 2 $\frac{3}{4}$ inches, is \$8.50 and \$9.50 per 1000; 10 gauge, 2 $\frac{1}{2}$ inches, \$9.50; 16 gauge, 2 $\frac{1}{2}$ inches, \$8 per 1000. Same discount as new club Shells.

Manufacturing.

THE ETTÉ & HENGER MFG. COMPANY, St. Louis, Mo., have resumed work at their factory, after a shut down of several weeks.

THE WATERTVILLE CUTLERY COMPANY, Waterville, Conn., shut down September 2 for two weeks, and it is reported that all the employees were paid off and discharged. The latter course is supposed to have been taken to avoid trouble with the Cutlers' Union, whose rules forbid the discharge of members without notice or reason being given.

L. W. VON BEHREN'S enameled handle factory at Marion, Ind., was destroyed by fire August 30. The building was a two-story frame structure, on which was \$1500 insurance; this does not cover the loss on the building. The machinery, which had recently been put in place, was a total loss.

THE SILVER-PLATE CUTLERY COMPANY, Ansonia, Conn., made a proposition to their employees to furnish them steady work for September at a reduction of 10 per cent. in their wages, as by reducing the wage cost on a line of goods a contract could be secured that would keep the employees at work on full time during the month. The workmen, some of whom are members of a strong union, would not agree to the reduction on the grounds that it would establish a dangerous precedent.

WE ARE ADVISED that W. N. Whitely will sever his connection with the Whitely interests at Springfield, Ohio, and will locate permanently at Muncie, Ind., where he contemplates erecting a Knife and Bar factory.

THE WORKS of the H. M. Myers Company, at Beaver Falls, Pa., manufacturers of Shovels, Spades and Scoops, were put in full operation on Monday morning, September 4, and will continue to run as long as orders justify.

THE WAGNER MFG. COMPANY, Sidney, Ohio, state, in a circular to the trade, that the fire which destroyed a portion of their factory on September 6 will not interfere with their shipments in the least. Their line of goods includes high-grade Hollow Ware, Sugar Kettles, Maules, &c.

THE IOWA FARMING TOOL COMPANY, Fort Madison, Iowa, have increased the capacity of their works; also their facilities for storing manufactured goods. Two shops have been added to their plant, with machinery to increase their Fork output more than 50 per cent. Another Hoe mill has also been built, doubling their Hoe product; and a 250 horse power Corliss engine has been added to their power. Their storage capacity has been increased by a warehouse with 30,000 feet of floor surface, from which they can load four cars at once. These improvements, it is remarked, enable them to produce and carry in stock a larger quantity of goods, and thus fill orders promptly.

C. E. HUDSON & Co., Leominster, Mass., report that while domestic business for Apple Parers this year has not been quite up to previous years, there has been a larger demand from Canada and foreign countries. A new clamping device has been added to the Rocking Table Parer, and is referred to as making a firmer grip on the table and also preventing the marking of the table. Their Hose Mender business has been exceptionally large.

Prize Competitions.

Prize Competition No. 27 (Reopened).

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we have reopened it, and extend the time up to which responses will be accepted to September 16.

Some points in regard to the subject appeared in the announcement concerning the competition in our issue of August 24, and will probably be of service to those who are intending to compete.

The committee to whom the papers in Competition No. 25 were referred have awarded the prizes as follows:

First prize to J. E. JANSSEN.
Second prize to A. Q. CASSELLBERRY.
Third prize to J. P. HUMES.

It Is Reported—

That the Hardware stock of F. W. Taylor, Sioux Falls, S. D., was damaged by water which was used in putting out a fire in the printing office above his store. The damage is estimated to be \$7,000, with insurance of \$8,500.

That P. Goldfinch of Corry, Pa., has sold his Tinsmith to John Lang, who will take possession at once.

That a sneak thief entered the rear door of McConnell & Luker's Hardware store, at Kittanning, Pa., August

30, and stole \$10 from the money drawer. He was seen making his escape, but could not be captured.

That J. A. Criswell of Mound City, Mo., has disposed of his Hardware stock to the Bridges Hardware Company and W. C. Andes & Co.

That a new Agricultural Implement warehouse will shortly be erected at Cameron and State streets, Harrisburg, Pa.

That the Hardware store of A. C. Osborne, West Duluth, Minn., was entered September 1 and robbed of \$150 and a dozen Revolvers.

That Stultz & Brendel, Hardware dealers, Zionville, Ind., have dissolved partnership.

That Shaffer & Mack of Pre-emption, Ill., have purchased the Implement business of T. C. Reid, Corning, Iowa. The new firm will take possession October 1, and will succeed to a business of six years' standing.

That the Implement business conducted by Bishop & Morton, at Carthage, Mo., has been purchased by Campbell Brothers.

That Hoover & Breiner, Hardware dealers, Bushnell, Ill., have dissolved, Mr. Breiner retiring.

That the Hardware firm of Adamson & Hancock, Mexia, Tex., have been dissolved.

That the Hardware firm of Meyer & Paulsmeier, Sweet Springs, Mo., have been dissolved.

That Middleton & Co., Hardware and Implements, Hannibal, Mo., will remove to Winchester, Ill.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices

There has been hardly any change in the condition of the market for leading lines of Paints and Colors. Outside influences, such as higher prices for Pig Lead and further reductions in prices of Linseed Oil, excite a certain amount of mental speculation, but one movement seems to act as an offset to the other in a great measure, and no direct result upon prices of the various products into which those commodities enter prominently is visible. Business is unaffected, and the demand seems to be governed almost wholly by imperative wants. Taken as a whole, the distribution has been somewhat larger the past week than during the preceding one, not only in the more staple lines of goods, but in several specialties in the line of Mixed Paints.

White Lead.—Some sales of carload lots of "outside brand" Western Dry Lead have been made here at about $\frac{1}{4}$ ¢ per lb under the minimum quotation as per card of the National Lead Company. It is reported also that sales have been made at corresponding low price in other Eastern markets. As far as it goes, this would indicate rather sharp competition, but the National Company profess to adhere to the official list and assert that the outside competition has no perceptible effect upon their trade. Furthermore, they claim that deliveries have been larger the past week than for some time previous, and that new orders are now generally well up to the average for the season. There has been no change in the condition of the market for "quick process" or mixed Leads; sales fair and prices about the same as for some time past.

Red Lead.—Foreign product in lots of 5 tons or thereabout has been taken to a fair extent at previous prices for near future delivery. Most of the business was at $6\frac{1}{4}$ ¢ @ $6\frac{3}{4}$ ¢. Spot stock has moved out slowly, however, and chiefly in moderate quantities, at the usual advance on invoice lots. Domestic brands remain unchanged in price and meet with merely routine sale.

Litharge.—Low grades, consumed chiefly by glass manufactures and the rubber trade, have been ordered for delivery during the remainder of the year to a very fair extent. For this class of product prices stand at about $5\frac{1}{4}$ ¢ @ $5\frac{1}{2}$ ¢, net cash. The better grades are held for full former prices, but find merely routine sales.

Zincs.—Most reports indicate freer movements in delivery on old orders for American Oxide, and, besides, some increase of new transactions, the general outcome being a more favorable market, with some signs of healing of weak spots that came more or less conspicuously to the front early in the autumn season. Foreign brands are quoted at the old range of prices, but sell in a retail way only.

Colors, &c.—There have been none but ordinary fluctuations in prices of the leading lines of Dry Colors and bulk goods used by grinders have undergone hardly any change. Business has improved slightly, but the buying is extremely conservative. Oil Colors are somewhat irregular, owing to the sharp decline recently in cost of Linseed Oil, and ready-mixed Paints are also affected thereby to a certain degree, more particularly where good-sized orders for future delivery may be involved.

Miscellaneous.—Recent arrivals have caused some accumulation of Block Chalk in first hands, but, as yet, receivers stand out for previous prices. Whiting is, in view of the foregoing, sold readily at old prices. The same may properly be remarked of Putty. Barytes and Clays in general are somewhat irregular as to prices and meet with rather slow sale.

Oils and Turpentine.

The general situation is very much the same as it was a week ago. The contest between the conflicting interests in the Linseed Oil line has continued unabated and led to a further reduction in prices; Coconut Oils have also ruled somewhat weak under the weight of excessive supplies. Cotton-Seed products are a shade firmer under the influence of better demand, but otherwise the conditions are virtually unchanged and a merely fair business

town brands have been sold at $1\frac{1}{2}$ ¢ @ $2\frac{1}{2}$ ¢ less in remote instances. The position is so unsettled at present, however, that all quotations must be accepted as purely nominal.

Cotton-Seed Oils.—More liberal purchases on export account have served to stiffen prices, and the market for both crude and refined Oils is looking decidedly firmer. Prime Summer Yellow, which was at one time down to $84\frac{1}{2}$ ¢, moved up to $86\frac{1}{2}$ ¢, and choice quality went at $87\frac{1}{2}$ ¢ @ $88\frac{1}{2}$ ¢. Prime quality crude Oil is now about $28\frac{1}{2}$ ¢ and offered reservedly. Unfavorable crop advices have, apart from the export buying, served to stiffen the market.

Lard Oil.—Prices have remained almost stationary at $65\frac{1}{2}$ ¢ @ $67\frac{1}{2}$ ¢ for present-make prime quality Oil. Those figures are very close to what may be termed normal market values, but buyers are quite as cautious as they were when the price was $10\frac{1}{2}$ ¢ higher, and merely a routine business is passing. Low grades are somewhat irregular in price and very slow of sale.

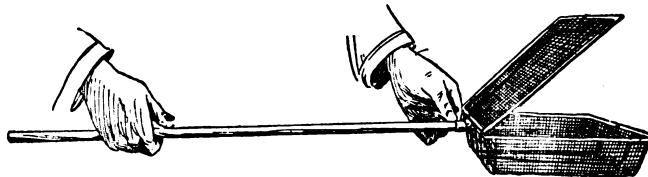
Fish Oils.—There has been no change in sellers' quotations for crude Menhaden Oil, but a larger business has been put through, and that, in connection with continued reports of light catch of fish, keeps the market very firm. In crude Sperm and Whale Oils there has been no change whatever. All pressed and refined Oils are steady at former prices, but moving out in jobbing quantities only.

Miscellaneous.—Olive Oil, ordinary quality, in barrels, has been selling at $80\frac{1}{2}$ ¢ per gallon on the spot, and may be had for future shipment at from $58\frac{1}{2}$ ¢ down to $55\frac{1}{2}$ ¢, according to quality, quantity, &c. Coconut Oils have been slow of sale, and while showing no radical change, prices are rather soft. Red Oils are somewhat weak, under the influence of heavy supplies, with private transactions reported at concessions from current quotations.

Spirits Turpentine.—Although stocks in receivers' hands have increased a few hundred barrels, the market has shown better form, under the influence of livelier distribution. Prices moved up to $30\frac{1}{2}$ ¢ for machine barrels, and some sales of regular barrels were made at the same rate.

The Acme Corn Popper.

Gilbert & Bennett Mfg. Company, 42-44 Cliff street, New York, with factory at Georgetown, Conn., are introducing the Acme corn popper, as shown herewith. The feature of the popper is the heavy wire lever by which the lid is controlled. When the lid is to be raised,



The Acme Corn Popper.

at old prices is about all that there is to note.

Linseed Oil.—There has been no truce between the "combine" and the "anti-combine" crushers. For that matter the contest is sharper than it has been at any time since hostilities were inaugurated, and the surface indications are that the present fight will be to a finish; in other words, the wiping out or absorption of the "independent" interest by the "combine." Whatever the outcome, the plain fact remains that best city brands of Raw Oil are openly quoted at $37\frac{1}{2}$ ¢, and that out-of-

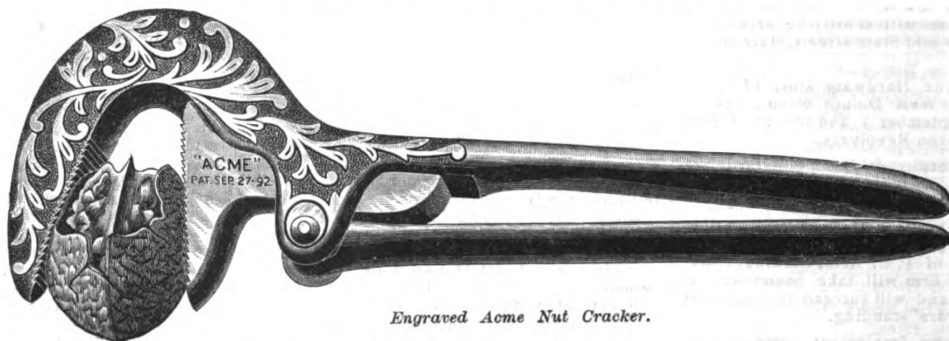
as shown in the cut, all that is necessary is a slight pressure upon the lever near the handle. The wire is so bent at the front end of the popper that when the lid is closed it may be securely fastened to the basket by the hooked part of the lever simply by drawing the wire back. This allows the lid to be opened or to be closed and locked without danger of burning the hand, and prevents the lid from clogging when emptying out the popped corn. The poppers are made in 1, $1\frac{1}{2}$ and 2 quart sizes.

Engraved Acme Nut Cracker.

The novel feature of this article, as illustrated in the accompanying cut, is the engraving, a plain pattern of the cracker having been put upon the market some time since by the manufact-

that the rubber on the plier will not become soft, nor slip off like a glove, or break off, but that it requires a hammer and chisel to get it off, and that it will stand boiling for 5 hours before it becomes soft. The plier measures 8½ inches over all, and is designed for the

relied upon; that there is no movement of a plate to throw it out of true; that the friction of the cap holds the cutter in place when the screw is loosened, this removing the liability of losing the cutter, and that there are no edges to catch the chips. It is pointed



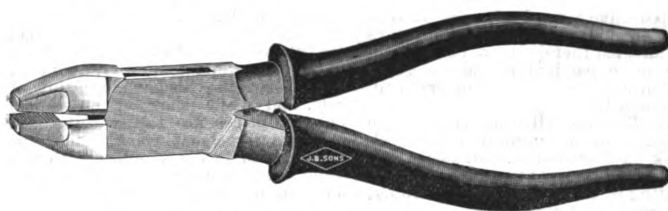
Engraved Acme Nut Cracker.

urers, the Acme Shear Company, Bridgeport, Conn. The cracker is 6 inches over all and consists of an upper handle and jaw in one piece with a short jaw worked by the lower handle. A steel coil spring is inclosed at the top of the short jaw, which automatically opens this to receive a fresh nut as soon

use of trolley men and all who are obliged to handle electric wires.

Expansive Bit.

The cut herewith given illustrates an expansive bit put on the market by the



Brombacher's Perfection Hard Rubber Insulated Pliers.

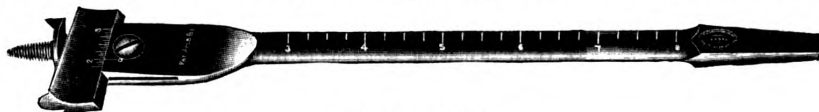
as the pressure on the handles is released. It is remarked that the construction is very simple and that the jaws are so constructed as to admit of cracking nuts of most kinds, from the

Lavigne & Scott Mfg. Company, 260 York street, New Haven, Conn. The feature of the bit is the absence of a screw plate, for which is substituted a spring cap, obtained by band sawing a

Hammer Handle Tack Package.

The Grand Crossing Tack Company, Grand Crossing, Chicago, Ill., are offering the above article as illustrated herewith. The cut represents the package one quarter its size, the handle being filled with steel carpet tacks. These are packed half a gross in a sand-papered box with hinged cover, in assortments of 6, 8, 10 and 12 ounce tacks. The manufacturers remark that the consumer pays 5 cents for a nickel's worth of tacks and gets a hammer for nothing.

During the past few weeks the emigration from this country has exceeded the immigration to it; an almost unprecedented condition of things. The Commissioner of Immigration for the port of New York states that Eastward-



Expansive Bit.

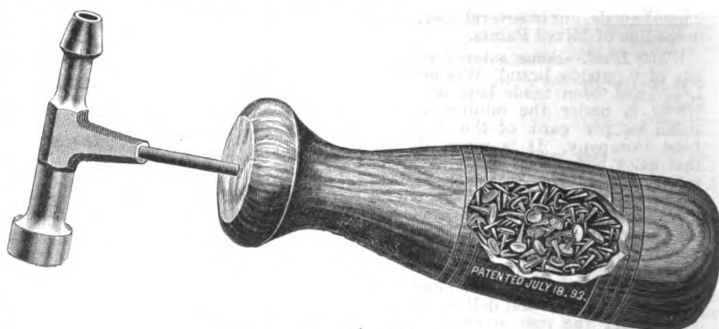
largest to the smallest. Each cracker is placed in an anti-rust paper pocket, half a dozen being packed in a neat box. The cracker shown in the cut is full nickel plated. The goods are also furnished perfectly plain, highly polished and nickel plated, also plain black japanned.

Brombacher's Perfection Hard Rubber Insulated Pliers.

Jacob Brombacher's Sons, 30 Cliff street, New York, are introducing the above article, as illustrated herewith. The handles of the side-cutting plier are covered with hard rubber, which is referred to as the best insulator known to science. It is remarked that the advantage the plier has over a rubber glove is that a rubber glove is apt to slip, and that it becomes soft and porous with age, and is therefore useless as an insulator. The manufacturers claim

short distance up the shank. Among the advantages claimed by the manu-

bound steamers are taking three or four times their average number of steerage



Hammer Handle Tack Package.

facturers for this construction are, that the graduation of the cutter can always

passengers back to Europe, the majority being Poles and Italians.